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CLIMATE JOBS AT TWO MINUTES TO MIDNIGHT

Brian Ashley

The Million Climate Jobs Campaign is an alliance of trade unions, social movements and popular organisations campaigning for a million climate jobs as part of the transition to a low-carbon and sustainable development path. The campaign is based on two fundamental points of departure. First, people want work. Globally, we are mired in an economic depression, the impact of which is aggravating already very high levels of unemployment and precariousness. Second, we have to stop the advance of climate change. To do that, we have to cut current annual greenhouse gas (GHG) emissions by seventy to eighty per cent within a ten- to thirty-year time frame (Neale 2008: 15).

Technically, that is quite feasible. We already have all the technology we need. The problem in getting action on climate change is political, not technological.¹ The governments of the world say they cannot act because it would 'cost too much'. But the cost would be the wages paid to workers to construct new renewable energy systems, public transport routes, buildings, etc.

In this instance 'cost' means jobs, yet jobs mean so much more than people just working. They mean dignity and giving expression to our creativity, and they establish the basis for our society's overall welfare. Just as there are unpaid externalities in the form of pollution from industrial processes, so there are unpaid externalities from the unemployment crisis in the form of crime, gangsterism, substance abuse, violence against women and children, and depression, which society has to bear.

Climate jobs are different to green jobs (Neale 2008). Green jobs can encompass any and all environmentally friendly jobs, such as in conservation and cleaning up oil spills. Climate jobs are those that help to reduce the emission of GHGs and build the resilience of communities to withstand the impacts of climate change. Examples of climate jobs include those in developing renewable energy plants; in energy efficiency, especially in retrofitting buildings; in public transport that reduces the pollution from cars and trucks; and, significantly, in small-scale organic agriculture, which reduces emissions of GHG in agriculture (AIDC 2011).

In this chapter I outline why climate jobs are critically important in the context of the weak outcomes of the 2015 Paris climate agreement (COP 21) and in light of South Africa's deepening economic crisis, the collapse of key industrial sectors and the mass unemployment crisis.

Albert Einstein is quoted as defining insanity as doing the same thing over and over again and expecting a different result. This is true for both South Africa's economic policies and successive agreements made during the meetings of the Conference of the Parties (COP) that are held under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC). In both instances, the more things change, the more they stay the same. In the case of South Africa's economic policies, the Growth, Employment and Redistribution (GEAR) strategy, the Accelerated Shared Growth Initiative for South Africa, the New Growth Path and the National Development Plan have all codified mainstream orthodox economic policies, such as fiscal 'prudence', inflation targeting and monetarism, with disastrous consequences for employment. Similarly, each COP climate summit avoids taking the necessary steps to cut GHG emissions, agreeing to a carbon budget and funding comprehensive adaptation strategies, including technology transfers for so-called developing countries.

If we are to avoid insanity then we will need to develop a strategy that delegitimises the power of those that stand in the way of dealing with the climate crisis and build a counterpower to the capital and the states invested in the fossil fuel system. This is easier said than done, but starts with developing a coherent and realistic alternative around which people can organise and mobilise.

SOUTH AFRICA'S MASS UNEMPLOYMENT CRISIS

In South Africa the greatest determinant of poverty and income inequality is unemployment. Earnings from work are the most important source of

household income and in the absence of a comprehensive welfare programme unemployment has a dramatic impact on household poverty (Adelzadeh 2003). The fact that South Africa is widely regarded as being the most unequal country in the world, as measured by the Gini coefficient, confirms the scale of the problem (Anand, Kothari & Kumar 2016).

Official figures record South Africa's rate of unemployment at about 27.7 per cent (Stats SA 2017: 1). However, the official statistics grossly underestimate the number of unemployed by excluding discouraged workers – the millions who have given up looking for work – and by including as employed anyone who has earned any nature of income, and performed any nature of work, paid or unpaid. When discouraged workers are included, the unemployment rate increases to 36.4 per cent (Stats SA 2017: 10).

Nevertheless, 27.7 per cent represents a massive social disaster. It is worth recalling that when unemployment reached twenty-five per cent in the US, it was the time of the Great Depression and the introduction of the New Deal, an extraordinary set of measures to give relief to the unemployed, stimulate the recovery of the economy and reform the financial system to prevent a reoccurrence of the depression. Under the weight of South Africa's unemployment crisis, the social fabric of society is collapsing, giving rise to a pandemic of crime, gangsterism and substance abuse.

The advent of neoliberal globalisation and the opening up of the South African economy to the world economy through trade liberalisation and the liberalisation of the current account, ultimately led to the financialisation of the economy, deindustrialisation and worsening unemployment levels (Marais 2013). The South African economy's vulnerability to shocks from the global economy was harshly exposed during the 2007/08 global financial crisis. Between October 2008 and March 2010, more than 1.2 million workers lost their jobs as the crisis took its toll, particularly in the mining and manufacturing sections of the economy (Ashman, Fine & Newman 2011: 179).

Once again, the winds of the global economy, this time the slowdown in growth in China and the decline in demand for mineral commodities, are pushing the South African economy to the point of recession. A new wave of retrenchments is destroying thousands of livelihoods. An economic growth strategy based on intensified exploitation of its natural resource wealth, combined with debt-driven consumption, offers virtually no hope for dealing with South Africa's unemployment crisis. A new sustainable development path and industrial strategy is needed. A low-carbon transition offers such a possibility,

especially if it is combined with other strategies to deal with poverty, such as a mass housing programme and agrarian transformation (land redistribution, enhanced food production and seed sovereignty).

ECONOMIC CRISIS AND THE DECLINE OF THE MINERALS–ENERGY COMPLEX

As suggested by the saying ‘never let a good crisis go to waste’, crises are not necessarily just about threats but can be the harbingers of opportunity. Things that seemed previously impossible suddenly appear feasible and realistic. This is perhaps no truer than with reference to the existential crisis unfolding in South Africa’s industrial heartland. It is not just the mining sector that is facing a crisis – the entire minerals, minerals-beneficiation and related manufacturing sector appears to be in decline (Moyo 2015).

The South African economy has been heavily reliant on cheap and abundant supplies of electricity (McDonald 2012). The energy and carbon intensity of the South African economy is a legacy of the evolution of a relatively narrow accumulation path, which has become known as the minerals–energy complex (MEC) (Fine & Rustomjee 1996). This has been an extractivist accumulation path focused on mining and mineral beneficiation based on cheap coal for generating cheap electricity. Together with cheap labour, cheap electricity has been critical to the growth and development of the MEC and central to South Africa’s industrial expansion strategies throughout its history (Fine & Rustomjee 1996).

Crucial to understanding the structural basis and dimensions of the MEC is to see just how central coal has been to South Africa’s energy system. Sixty-five per cent of South Africa’s primary energy supply is accounted for by coal in conversion both to electricity and to liquid fuels by Sasol (Baker et al. 2015: viii). Consequently, in the mining, concentrating, smelting and refining of various commodities, electricity, liquid fuels and even direct coal use are important inputs, accounting for a considerable proportion of their input costs.

Over eighty-five per cent of coal supply to Eskom remains concentrated in the major mining houses of Anglo American, Exxaro, BHP-Billiton, Glencore and Sasol. Coal mines, together with the mining of other minerals, especially gold and platinum, are in turn heavy consumers of electricity. Several of the big mining houses run major metal smelters that ensure that the Energy Intensive

Users Group, comprising thirty-one of Eskom's largest customers, consumes almost forty-four per cent of the electricity produced by Eskom (EIUG 2015).

However, the electricity supply and coal sectors are undergoing rapid change as both face mutually intersecting and related crises. The global economic crisis, especially its impact on commodity-producing countries like South Africa, aggravates the internal dimensions of these crises. So profound are these changes that they threaten the erosion of the MEC and its centrality to the economy, presenting both threats and opportunities.

ESKOM CRISIS

Eskom faces both a capacity and a financial crisis, the combination of which has ensured regular power outages that have inconvenienced consumers, slowed economic growth and led to investment uncertainty in the mining and related sectors. Taken as a whole, the impact of the crisis has been to undermine the legacy of cheap electricity so crucial to the mining and related industries.

While the electricity supply crisis is the result of many factors (poor planning, management, corruption, etc.), it nonetheless has its roots in GEAR, the neoliberal policy agenda adopted in 1996. GEAR curtailed state investment and promoted liberalisation and privatisation with severe consequences for Eskom.

Ever since Eskom was corporatised, its finances have been under stress. In March 2015 Eskom saw its investment rating downgraded to junk status by Standard & Poor's. This necessitated a R23 billion government bailout package to ensure the utility was able to prevent further blackouts. The financial difficulties experienced by Eskom forced the utility to take out a US\$3 billion World Bank loan in 2010, the bulk of which went towards the construction of the Medupi coal-fired power plant.

With major power shortages in 2007, a decision was taken to build two new coal plants, Medupi and Kusile, to meet growing demand. Both have been subject to major delays, technical challenges and massive cost overruns. Originally, it was estimated that Medupi would cost R30 billion. It has now grown more than tenfold to R105 billion.²

Several other factors, such as escalating costs of coal purchases, inflated salaries, gratuitous and costly bonuses and perks for a crisis-ridden organisation, ageing infrastructure, high maintenance costs and other inefficiencies, have made it difficult for Eskom to run a cost-effective utility.

The Eskom crisis is important from the perspective of transitioning to a low-carbon development path and in the increased role of renewable energy in the overall energy mix. Under the Renewable Energy Independent Power Producers Procurement Programme (REI4P) launched in 2011, only 3 725 megawatts (MW) of renewable energy were to be sourced. However, due to the scale of the electricity supply crisis, the minister of energy announced in December 2012 that a further 3 200 MW were to be procured. This was followed by a further allocation of 6 300 MW in August 2015, such was the pressure coming from rolling blackouts.

GREEN ECONOMY

Climate jobs are often confused with green jobs and with the green economy. Undertaking a transition to a low-carbon economy via the creation of millions of climate jobs should not be confused with green economy strategies and initiatives. The green economy is a process of marketising, commercialising and commodifying nature as a strategy to drive investment into fixing the damage capitalism, marketisation, commercialisation and commodification have done to the environment. This way of thinking was well captured by Janez Potočnik, former European Union environment commissioner, on the eve of the Rio+20 Summit: 'We need to move from protecting the environment from business to using business to protect the environment' (Potočnik 2011).

Yet, it is this approach of trying to develop a profit incentive strategy for dealing with the environmental and climate crisis that has been so detrimental to finding real solutions. A decade of potential action has been lost through false solutions such as carbon markets, the Clean Development Mechanism, reducing emissions from deforestation and forest degradation and other mechanisms for the commodification of the biosphere. That decade has seen no slowdown in the deepening of the climate crisis. It is precisely in this era of the green economy that GHG emissions have increased and that we have had the sharpest increases in temperature.

There are several problems with the whole green economy discourse. Not least is the duality it creates between the existing economy, which is dirty, polluting and unequal, and the clean green economy, which is not only good for the environment but is invested with characteristics like social inclusiveness and equity.

Yet the green economy is neither separate nor new. It is an expansion of the non-green economic system into new (and often artificially created) markets. Thus, the green economy is marked by the same imperatives of profit maximisation and competition as the non-green economy. Not surprisingly, the imperatives of addressing climate change are conditional on the same criteria shaping investment decisions in the broader economy. This means investments in green economy projects will occur at a level and pace essentially determined by the expectation of suitable levels of high profit and low risk (Rudin 2013).

The South African government has adopted the discourse of the green economy, promising to reconcile low-carbon and sustainable development with other valued outcomes, including job creation and poverty alleviation. In essence, the government's orientation and the dominant meaning it attaches to the green economy is green growth (Death 2014).

Two examples underscore how the workings of capital keep the green economy so underdeveloped. Eskom's inability to provide electricity is the first example. Contrary to widespread views, the government did not ignore the warning given in 1998 of an impending electricity supply shortage. Rather, it sought the partial privatisation of the utility. It invited business to become private power producers but the invite went disastrously unanswered. Eskom's boast of producing the cheapest electricity in the world kept capital away. The very cheapness of electricity was sufficient to deter would-be investors from coming to the government's proposed electricity party for private capital. Regardless of the profitable opportunity offered to investors and the country's need for electricity, capital stayed away. This was because capitalists invest not when simple profit can be made, but when profit can be maximised.

Renewable energy is the second example. The government is jubilant about what it claims to be the success of its current renewable energy programme. What it is less keen to make public is that this programme was delayed for several years. International capital finally became interested in South Africa's small-scale programme only when sufficiently maximised profit was guaranteed and when the renewable energy markets in other countries became saturated.³ Moreover, the programme is limited so far to supplying nine per cent of South Africa's electricity from renewable energy.

This second example shows that the green economy is subject to the same imperatives as Eskom's carbon economy. Equally unsurprising is the failure of government's green economy initiatives – where they have been successful in attracting investment and delivering profit – to fulfil their trumpeted social

benefits. Consider the government's solar water heating programme. In 2011, the government announced the start of an ambitious programme to install a million solar water heaters that would be delivered by the private sector. Funding of R4.7 billion was set aside for the programme. The government placed a local content target of seventy per cent to ensure local jobs. The results have been quite disastrous. According to the report of the Department of Environmental Affairs, only 336 391 solar water heaters had been installed as of May 2013 (Green 2015). This is some way short of the one million installations targeted by 2014/15. Targets have constantly been revised and the programme ground to a halt as a result of disputes over local content and disappearing state financing. A new target of March 2014 was set and then revised to March 2015. No solar water heaters were installed, despite stock sitting in warehouses, which has led to factories being mothballed and hundreds of workers being retrenched (Green 2015).

Of similar concern is the failure to stimulate downstream manufacturing and job creation through the programme. Only twenty per cent of the solar water heaters installed by 2013 were made in South Africa (Economic Development Department 2013) and all the available evidence to date suggests a very low rate of direct job creation through the programme.

One has to be sceptical about whether capital will invest in, never mind drive, a transition to a low-carbon economy. According to Jeff Rudin, a research associate with the Alternative Information and Development Centre,

it is important to bear in mind that the Green Economy is neither separate nor new. Rather, it is simply an extension of the same economic system that is responsible for climate change. This system is one in which the competition for profit leads to unending and limitless compound growth. The Green Economy simply extends this competition for profit into activities associated with clearing up and containing ecological destruction. It does not challenge or supplant the fossil fuel economy. Instead it provides ideological cover for the reproduction and continuation of that economy. It does this by creating the illusion that something is being done about climate change. But the impact the green economy has on reducing and mitigating climate change is totally insignificant compared to what is needed to prevent a terrible global crisis affecting both the whole of humanity and the planet. The green economy distracts us from the radical changes that are needed to prevent this from happening. In that way, it is part of the problem, not the solution. (Rudin 2013: 6)

CLIMATE JOBS AND TRANSITIONING TO A LOW-CARBON ECONOMY

South Africa can create many climate jobs that would contribute to reducing emissions of GHGs and other pollutants, as well as to unemployment. For this to happen, the state must take the lead and coordinate these efforts.

Climate jobs involve building renewable solar, wind, wave, tidal current and other power-generation options. Climate jobs also include work related to the building of a safe and efficient public transport network that would help reduce the number of cars and trucks on the road. Other areas include renovating and insulating buildings, transforming industrial agriculture, reforming production and consumption, and increasing energy efficiency. Additionally, water and sanitation have many climate change links, many but not all of which would create jobs. Significant jobs would be created in the related areas of research, education and training to ensure the country has the skills to undertake the transition to a low-carbon, labour absorbing and socially developed sustainable future economy.

In 2011, activists from trade unions, social movements, non-governmental organisations and academics came together to develop the platform of the Million Climate Jobs Campaign. They undertook a collaborative study, researching possibilities for creating decent work through transitioning to a low-carbon economy. Over thirty papers were commissioned from a diverse range of sectors, including the less obvious areas of tourism, health, waste management and ecosystem restoration. The Million Climate Jobs Campaign study found that, given the political will, over three million jobs of varying quality could be created in combating the emission of GHGs and building the resilience of communities to withstand climate change.

Recently, the campaign completed a research process that updated the 2011 platform, focusing on the key sectors that would have the most significant impact for emission reduction and job creation. Findings indicated that within a twenty-year period it would be completely feasible to make a significant step towards shifting to a low-carbon economy in the areas of electricity generation and distribution, transport, energy efficiency and construction, agriculture and managing waste to reduce current emissions from 547 million tons of carbon dioxide equivalent (CO₂e) to 129 million tons. This would involve creating at least one million sustainable and quality jobs (Table 13.1).

Table 13.1 Job estimates

Sector	Number of jobs
Electricity and renewable energy	250 000
Transport	390 000
Construction and repairs	150 000–200 000
Agriculture	100 000–500 000
Waste, industry and education	110 000
Total	1 000 000

With those jobs, emissions of GHG can be cut by more than three-quarters. Table 13.2 indicates how this can be accomplished. The second column shows current actual emissions in megatons of CO₂e. The third column shows estimated emissions after twenty years of climate jobs, showing a seventy-six per cent cut in total emissions.

The campaign readily acknowledges several methodological weaknesses in the study undertaken, not least in defining what is meant by a job. For example, the study draws on research undertaken by the Sustainability Institute (Spencer et al. 2010) for the Gauteng government in relation to promoting small-scale agriculture. Clearly, many of the jobs in small-scale agriculture take the form of livelihoods and are difficult to compare with, for example, jobs in manufacturing solar water heaters. Similarly, jobs created in transforming the health sector away from an institution-based curative model to a community-oriented preventative model can create a large number of part-time community health workers, which is not the same as formal jobs in low-carbon industries.

In addition, the Million Climate Jobs Campaign did not have the use of complex modelling tools to test and generalise the job creation strategies across sectors. Nevertheless, the evidence remains persuasive of the great many jobs that can be created through low-carbon economic strategies.

Embedding a shift to a low-carbon economy within a more comprehensive strategy and programme to meet the mass housing needs of poor South Africans, and stimulating small-scale production of food on a mass level through a programme of rural industrialisation, could secure the economic and social sustainability of this shift. Each of these areas has a reinforcing logic on the other in ways that ensure the whole is much greater than the sum of its parts.

Table 13.2 Total annual emissions in million tons of CO₂e

	Current* (million tons)	After (million tons)
Producing electricity	237	4
Transport	81	8
Industry	85	53
Agriculture	52	35
Heating buildings	42	17
Leaks	26	5
Waste	20	6
Other	4	1
Total**	547	129

Notes: *The figures are from 2010, the last year for which there are reliable numbers.

**These figures are calculated as percentages from those given in the official government report for the UN (DEA 2014: 76, 275). The figures do not include land use. Including land use would reduce the total from 547 million tons to 521 million tons. This is because there is a net reduction in emissions due to the fact that agriculture has been declining in South Africa, which means that some farming land has changed into grazing, forestry or unused land, and some grazing land has changed into forestry or unused land. There is no reason to assume that this trend will continue. Indeed, some proposals for supporting small farmers would probably lead to an increase in land under cultivation and used as pasture. The manufacture of liquid fuel, mainly by Sasol, and the small emissions from refineries in transport are included. Aviation fuel is included in transport. Our total is three million tons higher than the official total without land use, because we have included the three million tons from international aviation bunkers in transport; in the official records they are recorded only as a note, not as part of the total.

However, moving from the current extractivist economy to a diversified low-carbon economy is easier said than done. Doing so in ways that do not lead to massive job losses is even more difficult. Nevertheless, regardless of the substantial restructuring that is required, the depth of the crisis in the mining sector and the broader economy creates the opportunity. The urgency for this transition is made more acute when taking into account the crises of resource depletion (water resources, soil, air) (Swilling & Annecke 2011), the climate crisis and the carbon intensity of the South African economy.

In fact, the mining sector could be an integral part of the transition to a low-carbon sustainable path. For example, renewable energy technologies are built from minerals, of which South Africa is a major producer. Recent research indicates that solar and wind facilities require up to fifteen times more concrete,

ninety times more aluminium and fifty times more iron, copper and glass than fossil fuels or nuclear energy (Montmasson-Clair 2015: 9).

Other low-carbon technologies could also constitute major opportunities for some mining value chains in South Africa. These include fuel cells, an energy storage and conversion technology that could notably power electric transport. They require a number of metals as catalysts. Since the electricity and transport sectors are the biggest contributors to South Africa's GHG, it makes sense to focus on these sectors.

ELECTRICITY SECTOR

The biggest contributor to both jobs and emission reduction would be to decarbon the energy sector (Altieri et al. 2015). South Africa is the twelfth largest emitter of GHGs in the world (Environmental Defence Fund 2014) and has a per capita emission profile similar to large industrialised economies such as Germany and Britain. As noted, this is because of the energy intensity of the economy. South Africa's coal-dependent electricity sector is responsible for forty-five per cent of national emissions (237 megatons of CO₂e in 2010) (Baker et al. 2015: viii).

South Africa has access to some of the world's best renewable energy sources. South Africa's location, geography and size all play a role in providing the country with multiple renewable energy resources. A coastline of approximately 3 000 km provides favourable conditions for wind power throughout the country. Most areas in South Africa average more than 2 500 hours of sunshine per year, and average solar radiation levels range between 4.5 and 6.5 kilowatt hours/m² in one day.

A clear trend documented in international studies is that utilising diffuse renewable energy resources is more labour-intensive than utilising the highly concentrated energy in fossil fuel resources. A report in June 2015, *Global Green Growth*, found that

per \$1 million in spending in each country (converted at current exchange rates), clean energy investments generate, on average, about 37 jobs in Brazil, 10 jobs in Germany, 100 jobs in Indonesia, 70 jobs in South Africa, and 15 jobs in the Republic of Korea. Critically, ... we also find that the clean energy investments create more jobs in all five

countries than spending the same amount of funds within each country's fossil fuel sectors. In the cases of Brazil, Indonesia, and South Africa, the net employment gains for clean energy investments are substantial. (UNIDO & GGGI 2015: 24)

INDEPENDENT POWER PRODUCERS PROCUREMENT PROGRAMME

South Africa's renewable energy programme, the REI4P, has been underperforming in terms of job creation, while overperforming in terms of attracting investment.

The REI4P has resulted in the approval of over 6327 MW of renewable energy under four bidding rounds. Of this, fifty-three per cent is for wind, thirty-six per cent for solar PV and ten per cent for concentrated solar power. Ninety-two projects have been approved, attracting a combined investment value of R192 billion (approximately US\$13 billion). Forty-two projects totaling 2142 MW were connected to the grid by October 2015. Successful projects sell to Eskom's grid under a twenty-year government-backed power purchase agreement.

The programme won several accolades, especially from the international renewable energy industry and developers who found in the South African programme a viable alternative to the constrained markets in the US and Europe. But it has not delivered on jobs, social benefits to local communities and knock-ons to downstream industries. This is due to the initiative being framed in terms of the government's green growth perspective. As opposed to locating the sourcing of renewable energy as part of a comprehensive programme of transitioning to a low-carbon economy, where industrial and trade policies could be recast to support the development of downstream renewable energy-related industries, renewable energy is promoted as simply diversifying the energy mix, alongside gas, nuclear and coal.

Hence, it is not surprising that the programme has failed to live up to its job creation potential and has not led to substantial emission reductions. Table 13.3 highlights the dearth of jobs created in this privatised, profit-maximising programme.

Table 13.3 Jobs in the REI4P

	Bid Window 1	Bid Window 2	Bid Window 3
Construction jobs	6 074	5 221	7 813
Operational jobs	9 960	7 227	17 749
Total	16 034	12 448	25 562

Source: DoE (2015: 135).

Note: One job = 12 person months.

MOVING TO ONE HUNDRED PER CENT RENEWABLES

Research conducted by the Million Climate Jobs Campaign in 2016 indicates that in a twenty-year period it would be possible to generate almost all our electricity from renewable energy sources, even when this is based on a dramatic increase in the amount of electricity needed (AIDC 2017). According to the Council of Scientific and Industrial Research (CSIR), there is no longer any technical reason why renewable energy could not provide one hundred per cent of our electricity most of the time, with open-cycle turbine back-up when necessary (Bofinger et al. 2016). The campaign's research envisages a tripling of electricity so that clean electricity can replace coal, oil and gas in many parts of the economy. Extrapolating from the CSIR study, the campaign established it would be necessary to build six gigawatts of capacity of wind energy a year for twenty years and nine gigawatts of solar PV (AIDC 2017: 24). It would also involve the construction of a new smart grid to accommodate the many more 'suppliers' of electricity.

Table 13.4 shows estimates of how many jobs would be required. These estimates are based on the number of jobs that are currently required around the world to build wind and solar capacity. Also taken into account is the marked recent fall in the number of workers required to manufacture solar PV cells.

The fact that most existing coal-fired plants are reaching the end of their lifespan makes this transition both possible and realistic. It is also worth noting that the costs of generating electricity from solar and wind have come down substantially to levels on a par with or cheaper than coal-fired energy (WWF 2014). However, such levels of job creation are predicated on local production

Table 13.4 Average number of new energy jobs each year

Building and installing wind power	66 000
Building and installing solar power	122 000
Building and operating a smart grid	62 000
Maintenance and repairs	0–88 000
Total	250 000*

Note: *When ‘maintenance and repairs’ is taken as 0.

of the inputs into the renewable energy programme. In the REI4P, most of the inputs are imported and the jobs created are relatively short term, concentrated in construction, security and maintenance. Based on the advance in renewable energy technologies, we believe we can be even more ambitious in shifting to renewable energy as the main source of energy, especially if there is a state-driven and socially owned programme.

New research is required to take into account new modelling studies that indicate a much greater potential for job creation, as well as the current experience of the REI4P, which has shown much lower impacts on job creation.

TRANSPORT

After the electricity sector, transport accounts for approximately thirteen per cent of South Africa’s total GHG emissions, most of these as a result of road transport (Table 13.5). Finding ways to cut emissions from transport would go a substantial way towards reducing the carbon intensity of our current development path.

Expanding public transport is central to transitioning to a low-carbon economy and reducing the carbon intensity of the economy. Expanding public transport in ways that reduce our GHG emissions can lead to the creation of 390 000 climate jobs. Furthermore, the expansion of public transport has several important social benefits: overcoming the still dominant racial segregation of our cities, increasing the mobility of poor people and facilitating a greater public role for women in society. To achieve these objectives, it is vital to get more people to use public transport, to shift freight from roads to rail,

Table 13.5 Contribution of different modes of transport to emissions, 2000–2010*

Mode and energy carrier	% contribution to overall emissions
Domestic aviation (kerosene and aviation gas)	7.08
Road	91.56
Rail	1.36

Source: DEA (2014: 95).

Note: *Excluding emissions from the production of fuels.

to transition the energy source of public transport from oil to electricity and to source that electricity from renewable forms of energy.

The legacy of apartheid, especially the spatial dimensions whereby workers live far from their places of work, as well as the privatisation of the transport sector, especially freight, have contributed enormously to the legacy of high GHG emissions in transport (Prozzi et al. 2002: iii). This was spelled out in a 2002 study on GHG scenarios for South Africa:

Privatization in the freight sector has also propelled large modal shifts from rail to truck. Until 1988, trucks were not allowed to compete with the government-owned railroad. When the freight sector was deregulated in 1988, truck use rapidly expanded, resulting in lower freight tariffs, and a large drop-off in rail use. (Prozzi et al. 2002: iv)

Hence, the most important way of cutting emissions in transport and creating jobs is by expanding the public transport system for both commuters and freight, and transitioning commuters and freight into electric-driven modes of transport, especially rail. Rail expansion is particularly important in mitigating emissions in transport when taking into consideration that diesel rail locomotives use about one-sixth of the diesel used by trucks carrying the same volume of freight (Barrett 2011).

The impact on the reduction on emissions would be most significant were rail transport to be powered by renewable energy. This is something that could be considered after a decade of undertaking a planned transition to a low-carbon economy and once the most pressing uses for renewable energy have been taken care of. Table 13.6 shows current figures for modes of transport

Table 13.6 Commuter use of different modes of transport

Mode of transport	%
Trains	4.4
Buses	10.2
Minibus taxis	41.6
Cars	13.7

Source: Stats SA (2014).

used to travel to work and education each day. Over fifty per cent of people use some form of public transport, with just under fourteen per cent using a private car. In addition, one million people walk to their places of education and 2.9 million walk to work (Stats SA 2014).

By expanding the public transport system and using various incentives and regulations, it would be possible to switch half of all car journeys to public transport (twenty-five per cent rail and minibus, respectively, and fifty per cent bus). That would account for four million people in total. It can also be assumed that an additional four million people would take public transport each day: workers who now have climate jobs, people who previously walked to work and people who are attracted to a better transport system. In sum, that would be eight million more travellers on public transport: two million on light rail, four million on buses and two million on minibus taxis. That would require building new light rail and bus rapid transit lanes. It would also mean building better and safer facilities for walkers, safe cycle-only lanes and proper waiting stations and sanitary facilities at the start of minibus lines. To make bus transport attractive, it would be necessary to have bus-only lanes and roads during rush hours. This would discourage people from using private cars to commute, and massively cut transport times for people in buses and minibus taxis, who would get to work quickly, comfortably and safely. Table 13.7 shows the estimated number of new jobs that would be created if there were eight million new travellers using public transport.

In this scenario, a far better transport service could be supplied. It would be safer, much quicker due to fewer traffic jams, and less crowded. There would also be more cheap transport for people who currently walk to work and better, safer routes for cyclists and walkers. Better, cheaper and quicker transport could also be supplied to and from rural areas.

Table 13.7 Estimated number of jobs created each year by expanding the public transport system

	New travellers (million)	No. of new jobs
Rail	2	30 000
Bus	4	100 000
Minibus	2	100 000
New building/construction required		70 000
Total		300 000

CONCLUSION

South Africa faces a major crisis in the electricity supply sector that is estimated to continue until at least 2020. The mining sector is also in crisis, signalling a spiralling process of deindustrialisation and stranded assets. The major mining houses that have been central to the development of the South African economy over many decades have now reinvented themselves as global corporations. With collapsing commodity prices, these corporations have undertaken a major restructuring effort, which will see tens of thousands of jobs disappear. At the same time the coal industry is reorganising itself away from dependence on long-term supply contracts to Eskom, favouring exports into international markets. Eskom itself is in major financial difficulties, with its credit rating valued at junk status. At the same time it is expected to drive a major build programme which includes a nuclear programme that is set to cost over R1 trillion. Many of its existing coal-fired plants are coming to the end of their life cycle. In other words, the entire MEC is facing its own organic crisis, to use Gramscian terms.

To this we must add the accelerating climate crisis and the successive failures of the intergovernmental process within the UNFCCC to bring about the necessary emission reductions to stop runaway climate change. South Africa's current energy policy locks the country into a carbon-intensive future. The shift to a low-carbon equitable and sustainable development path will not be the outcome of polite lobbying of government ministers and policy makers. It is impossible to believe that the foreign transnational corporations and their junior Black Economic Empowerment partners can be relied on to drive such a transition. To achieve this, it will be necessary to put together a new political

bloc drawn from organised labour; small and medium-sized enterprises with strong roots in the local economy; community-based social movements representing unemployed sectors of our society; enlightened and radical environmentalists; and the potentially new organic intellectuals of the radicalising student movement. Some steps in this direction are present and growing as people question in more fundamental ways the current political-economy trajectory in South Africa.

In this bloc of social forces, the trade union movement will play a critical role. They (at least their members) have the most to lose by ignoring climate change. It is well documented that climate change will most adversely affect the poor, workers and other vulnerable sections of the population (Stern 2007). A strategy focused on saving jobs in traditional sectors such as coal mining, road transport and the fossil fuel energy sectors is a recipe for failure. In most cases these industries are already in decline and shedding jobs. For example, there has been a progressive loss of jobs in the coal sector over several years, even though it was earmarked in the government's economic strategy for substantial growth. In addition, research has indicated that there are more jobs in shifting to low-carbon industries than in the traditional polluting industries (UNIDO & GGGI 2015).

It remains to be seen whether the response to the current electricity crisis will be confined to shoring up the existing system or whether the opportunity will be taken to embrace a sustainable energy paradigm.

The power of the Million Climate Jobs Campaign lies in taking up the two most compelling challenges of our time in a single campaign, namely climate change and mass unemployment. By demanding that governments create climate jobs and by mobilising millions of working people around these demands, it is possible to begin the necessary task of shifting the balance of forces between labour and the state and the state and the market.

NOTES

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- 2 S. Tau, 'Medupi to cost R105 billion – Eskom', *Citizen*, 30 August 2015.
- 3 J. Rudin, 'Imprisoned in Paris: Alternatives to the green economy', *Amandla*, 43/44 (2015): 26–27, <http://aidc.org.za/amandla-media/amandla-magazine/back-issues/> (accessed 19 August 2017).

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