
PAGE PARTNERSHIP FOR ACTION ON GREEN ECONOMY

# The Green Economy in South Africa

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## Introduction

While the idea of a Green Economy (GE) goes back to the 1970s, where it had a singular environmental protection focus, it is only in the post 2008 Global Recession era that the concept has received detailed theorizing. But it is not just conceptual clarity that is the desire of much of the debate. Instead, the focus is / should be on the positive impacts that the GE will have on society – natural resource management, environmental protection and decent employment creation through the catalysis of new industries. Like all new concepts and ideas, there is a degree of goal displacement in the pursuit of conceptual coherence by attempting to align it with Sustainable Development while being clear on the definitional elements of the GE. However, the fact of the matter is that in many countries around the world, the GE has created new industries related to Renewable Energy (RE), Energy Efficiency (EE), Waste Management (WM) and Recycling, Bio-Fuels (BF) and the Built Environment (BE). From wind turbine component manufacturing in Denmark to solar panels in China, the GE has created new economic sectors with significant employment creation potential. The question is: Can the GE in South Africa have the same positive impacts in helping dent the unemployment challenges facing the country while achieving multiple environmental and economic objectives? The National Development Plan (NDP), talks about such a vision in Chapter 5 "Environmental sustainability - An equitable transition to a low-carbon economy". This vision is echoed in a range of other policy documents such as the various iterations of the Industrial Policy Action Plan (IPAP), the New Growth Path and most importantly, the National Climate Change Response White Paper. In all these documents the idea of realizing multiple objectives through the pursuit of Green Growth through the GE is discussed and illustrated. But what is the GE and what are the costs and benefits and how do policy makers and investors collaborate to achieve such desirable outcomes? As is often the case, the devil is in the detail.

Framework Issues

In terms of the "Precautionary Principle", there is good reason to pursue the GE and Green Growth to mitigate climate change. At worst citizens would benefit from a cleaner environment and air to breath and at best the economy would grow and thereby absorb labour with obvious socio-economic benefits. Instead of getting into the doctrinal disputes, especially those that absorb much energy at international agency level, it is fair to discuss the GE as a way of transitioning a society away from a carbon-intensive, brown, economy to a mode of manufacturing and consumption based on reduced reliance on fossil fuels with less Green House Gases (GHG) emitted into the atmosphere. By reducing GHGs, global warming might be mitigated while re-orienting country economies. In this sense, the GE is about energy, manufacturing and consumption change for the optimal benefit of society. All in society have to benefit from such a transition. The move from brown to green cannot simply lead to those involved in the former becoming worse off in this process.

South Africa contributes between 1 and 2% to global annual GHG emissions. This means that even if the country cuts its emissions in half, this will have minimal impact on the global situation. At the same time to cut South African emissions by half will have significant economic consequences. New technologies are not cheap and also less reliant in meeting society's 24/7 energy needs. This increased cost will impact on GDP and the resources available to meet the needs of the poor and marginalized in South Africa. Similarly, carbon taxes on heavy emitters will increase production and consumption costs impacting on household incomes. These taxes are not insignificant, especially in South Africa where growth is unlikely to surpass 2% in the medium-term future. So, in the global context, the question really needs to be asked: Can South Africa afford the GE? Part of this answer has to take into account the pledges made by the European Union and other countries to support South Africa's GE initiatives. However, a country cannot rely on pledges and judging by international commitment in turning pledges into cash with regard to the Millennium Development Goals, such an approach would be very high risk. The Global Green Fund, many years in the making at all the Congresses of the Parties, still does not have the capital necessary to fund mitigation initiatives in developing countries, the hardest hit by global warming. As we see in their electoral behaviour, politicians in the developed world are now almost completely focused on internal affairs.

Where will the money come from to fund GE initiatives? National Treasury will not ring fence carbon and other environmental taxes. The private sector is interested and willing to finance and invest in many of these initiatives. However, to benefit from this interest, South Africa has to put in place new and appropriate regulatory frameworks to enable this. But this is not easy. With nearly 150 years of a Minerals Energy Complex based on coal, developing new and enabling regulations that will encourage this sector, in all its dimensions, is frustrated by a combination of bureaucratic inertia and a fear of the unknown. A good example of this is the permanent delay in NERSA finalizing South Africa's Small Scale Embedded Energy Generation regulatory architecture. This has left investors and some municipalities exasperated, to say the least.

In South Africa, the GE has incredible potential but this is unlikely to be realized fully in the near or even medium-term future. This is a controversial statement, so it must be supported with more argument. First, proponents of GE growth tend to focus on RE and present the REIPPP as a major success, a global leader in RE regulation and procurement. But it is

important not to lose sight of the fact that, irrespective of scale, the employment creation potential here is limited as South Africa cannot compete with first out of the blocks manufacturers with economies of scale. China is the best example here. So, the more RE South Africa procures, the more jobs it creates for citizens in other countries. This sad situation was predicted about 5 years ago in the path-breaking assessment of the employment creating potential of the GE in South Africa. The regulatory frameworks are tenacious and hostile to the mass roll-out of so many GE technologies. Solar Water Heaters are a good example of this. Similarly, the regulation and enforcement of waste management policy has resulted in some being enriched (the plastic bag tax and tyre recycling fiascos are illustrative here) while waste pickers pull trolleys up to 30 kms a day to collect and sell recyclables. There is no shortage of waste, only a shortage of initiatives to maximize effective recycling. South Africa is far behind so many other countries in recycling.

With the above issues in mind, it is necessary to look into the sectors of the GE in greater detail so as to understand the challenge and failure to realize its potential better.

Renewable Energy

As noted already, REIPPP is presented as a global leader for the procurement of RE. However, it is premised on a market competitive price bidding process. This forces prices down as developers compete against each for trenches of power. As prices go down, there is a need to cut costs. The local manufacture of components for RE suffers as it cannot compete with the economies of scale and efficiencies of established producers. There is a serious debate about the cost and reliability of RE in powering South Africa. The CSIR has done the modelling and the answer here is positive. These are highly technical arguments and this is not the place to engage them in detail. However, some key issues need to be raised. RE, especially wind, is presented as being cheaper than coal. This may be true. But, to ensure reliability of supply there will have to be a mass roll out of turbines around the country. This is great for GHG reduction, but not so nice for birds and bats. The visual and noise pollution of turbines is a factor that is not adequately taken into account in the required environmental impact assessment. Also, the cost of rolling out turbines that will not produce at full capacity needs to be factored in.

The other RE technologies also have technology and other limits. In the case of the solar technologies, they only produce when the sun shines about 8-10 hours a day. The cost here of a technology that is only active for less than half a day is a significant cost factor in relation to other energy production technologies. Solar photo-voltaic is also inefficient meaning that solar farms have to be on a large scale to produce energy. Solar concentrated solar is much more expensive than photo-voltaic due to the need for mirrors, boilers and generators. In defence of solar CST the argument is often presented that it does enable storage through tanks where salts are melted at high temperatures thereby allowing for the generation of power after the sun has set. This technology is expensive and cannot solve the problem of reliable, widespread supply.

On industrial scale, RE technology is simply not developed enough to provide energy security and therefore will perform a support as opposed to dominant supply position in South Africa and many other countries. There is one area where Solar PV has significant potential. Roof top solar is no brainer in contexts where there is predominant day-time activity. Thus shopping centres, office blocks, schools and universities are obvious targets for roll out. This is happening on a small scale in parts of South Africa with the Victoria and

Alfred Waterfront in Cape Town being a good example. The constraint on the expansion of this deployment of Solar PV was mentioned above. NERSA has refused to finalise the regulatory framework for this with regard to small roof top plants selling excess power back into the grid. In this way, property owners are incentivized to use their roof tops as power stations. Without this, the property owner has to cover the capital cost and partly repay it from energy savings. This makes it much more expensive to do and this is one part of the reason why it is hardly taken off. The other reason has much to do with municipal finance and the fact that many local authorities generate (pun intended) about one third of their operational finance from onselling electricity to consumers. The more small scale generation and consumption there is by property owners, the less revenue for municipalities. Unless this is resolved by re-modelling municipal finance the less likely it is that this opportunity will be realized.

It may be argued that this view of RE is too jaundiced and pessimistic. Well, a Solar PV plant has closed and the Chinese have scrapped plans to build a large plant in South Africa. Inadequate demand means that it is not cost effective to invest in local manufacturing and assembly. The consequence is the failure to grow the economy in terms of GE objectives.

Energy Efficiency

The move towards energy efficient lighting in South Africa has been spectacular. This is due to impressive programmes through ESKOM to subsidise CFL light bulbs and encourage mass take up of them. This has not resulted in such local manufacture. The jobs are in China but at least South African households, roads, businesses etc. can now be lit with bulbs of up 80-90% efficiency in relation to traditional incandescent and vacuum bulbs. This means less carbon emission for more light. But the real conundrum in South Africa is the failure of Solar Water Heaters (SWH) to capture the imagination of citizens. SWHs are a common feature on RDP houses and this provides hot water to communities that are either not on the electricity grid or cannot afford electricity for water heating. In this context, SWH have had a major and positive impact on the quality of life of many households. But, the real energy saving is in the well-off suburbs where a family of 5 will consume up to 250 litres of hot water a day. This excludes Cape Town now! The cost of installing a SWH will easily be recouped over a period of a few years taking into account electricity price increases and the fact that most middle to upper class household spend up to a third of their energy costs on water heating. With sunny skies, South Africa is an obvious and efficient country for the mass roll out these technologies. Yet, local manufacturers are going bankrupt and closing plant and employment is shrinking instead of expanding in this sector. Why?

There is a complex and toxic mix of national and local regulatory indecision coupled to inflexible standards for SWH component installation in South Africa. The subsidy proposed by ESKOM some years back helped, but is no longer available. Municipalities could play a major role in identifying and certifying suppliers and ensuring that billing shows the saving enabling the monthly repayment of the SWH capital cost. But, as noted above, the more SWH installed means less electricity consumption and less income for many municipalities. Without municipal finance reform, SWH manufacture, installation and maintenance as opportunities for growth and labour absorbtion will remain stultified. This is particularly pertinent with regard to youth employment as installation and maintenance require young people who are able to climb up onto roofs.

Waste Management and Recycling

Waste management provides so many opportunities to pursue optimal interventions that create economic and employment opportunities while reducing the GHG emissions. Municipalities in South Africa face major infrastructure challenges with one of the most serious being the inability to effectively process and treat sewage. Consequently, water sources are polluted at great risk to community health and country water security. Such plants could easily be rebuilt in a way to harvest the methane from decomposing sewage. This renewable source of natural gas could easily be used to generate energy or provide a cheap source of energy for communities both urban and rural. This would decrease the need to source fire wood for heating and cooking and preserve increasingly declining indigenous forests. Moreover the bye product could be used as lawn dressing. The natural gas in compressed form can also be used to fuel public transport delinking costs from oil prices while creating employment in retrofitting and vehicle maintenance. In all of these opportunities, there are economic and employment creation prospects. Why has this potential not been realized beyond small scale landfill gas projects in some municipalities? Natural gas harvesting through digesters is a significant source of energy for poor households in India and China. There are employment opportunities in the manufacture, operation and maintenance of gas equipment in this regard. It is really a lost opportunity and tonnes of dangerous methane enters the atmosphere due to poor infrastructure planning and maintenance.

South Africa is way behind so many countries, developed and developing, in recycling the obvious materials such as paper, metal, plastic and glass. With national and local policy and enforcement the economic and employment creation opportunities would be realized. Instead of coordinated action, we see daily waste pickers pulling trolleys through the suburbs going through bins. This is hard, harsh and hazardous work. Proper vehicles, storage lockers, protective clothing and other interventions might expand this source of employment and make it more sustainable. Municipalities are hardly pro-active here and the high profile interventions are inadequate to realise the full potential of this economic activity. There are many reasons for this. Ownership of waste is one as well as the domination of the waste sector by powerful companies. There are options here in terms of ensuring separation at source for recycling while creating Material Recovery Facilities at landfill. At such MRFs, recycling and beneficiation of waste has significant economic potential. Building rubble can also be recycled with cement, highly carbon intensive, being re-used while brick making being a source of small business creation. There are so few MRFs in South Africa with such a waste problem as evidenced by dumping, especially building rubble, in public places. There needs to be innovative policy and infrastructure to take full advantage of waste to recycle and reduce GHG in the re-using / purposing scarce resources.

Bio-Fuels

Bio fuels are not only renewable, they also have lower GHG emission levels compared to fossil fuels. However, there is a major challenge in pursuing this energy source. Using certain crops for fuels will endanger South Africa's already hazardous food security environment. More crops for fuel means less food with higher prices for citizens. This is the case with corn in the USA. The increase in the production of bio-diesel resulted in a significant increase in the cost of corn. This would be disastrous in South Africa as corn / mielies is a staple food for many, especially, poor citizens. South Africa is therefore correct to have strict regulations on what crops might be farmed for fuels. Here, bio-diesel is basically not on the agenda. Instead, the prospect for bio-methanol to be blended with petrol has great potential. There is a plant in Zimbabwe using sugar cane. But in South Africa, sugar cane is considered a food source to

be protected. This means that sugar beets and sorghum are the main source for bio-ethanol. In the Eastern Cape, a plant is in operation with a supply chain based on small farmers who are the beneficiaries of land restitution. Again, the prospect for addressing multiple social, economic and environmental challenges is illustrated here. However, the challenge in incentivizing this sector relates to the regulated blending percentage of petrol with bio-ethanol. In Brazil, the world leader in this technology, it is up to and including 25%. In South Africa, the blending ration cannot exceed around 12%. This does not incentivize the expansion of the industry which is especially labour intensive in the agricultural component.

Built Environment

Cities and building have a significant and negative impact on global warming through their use of cement and concrete. It is not just the mining of the raw materials, but the manufacture of cement is energy and carbon intense. The use of alternative and new building materials that have better insulation and resilience will contribute to healthier and environmentally supportive structures. Currently, only corporate headquarters and boutique hotels are pursuing these new building technologies to their fullest. There are so many underutilized opportunities here and only two will be mentioned. Cement with better insulation and air circulation properties is feasible using fly-ash from coal-fueled power stations. It is lighter as well having positive effects on structure and design. Similarly, mine sludge can also be de-toxified and used for building materials. Imagine Johannesburg without mine dumps that have been converted into cheap and sustainable bricks for housing. Instead of using fired bricks, these bricks could be the foundation for the further roll out of mass housing. This is a labour intensive and economic expanding opportunity where small businesses might prosper. Why has it not taken off on such a large scale where the benefits are obvious?

Conclusion

The above and brief overview of GE sectors shows that reducing GHG emissions is not incompatible with economic growth and labour absorbtion. However, for the potential of the GE to be realized, there is a need for all stakeholders to move away from doctrinaire positions and policy towards pragmatism and stakeholder collaboration. This is easier said than done. This is particularly the case in the GE context where there is a simultaneous need for policy and regulatory innovation while achieving bye-in for new technologies and approaches to infrastructure and economic development. Thus, the GE as it relates to Climate Change, mitigation and adaption is a classic “wicked problem”. Everything is interlinked without actors knowing precisely what the linkages are and within this complexity, interventions have hard to predict outcomes. This makes it risky to intervene in such a complex environment (pun intended) thereby limiting the supply of private and public capital to drive projects to completion. This system complexity exists at two levels: The environment (nature, industry, human needs, energy) and policy (stakeholders – govt, business, CSOs – all of whom are not unified actors with similar interests and policy needs – with government in itself being the most complex of all). These two systems with their unique dynamics do not easily intersect and this adds to the risk of pursuing GE investments and projects. There is also too much emphasis on RE in the GE debate and this ignores and undermines other sectors that might have a more positive socio-economic impact on South Africa, especially with regard to labour absorbtion. At the rate of progress in the pursuit of the holy grail of nuclear fusion energy, it is worth asking why invest in RE technologies that in a decade are likely to be obsolete. Instead, use all resources available to drive growth and then pursue the best and cheapest later. Remember, South Africa accounts for between 1 and 2% of global

emissions and as a developing country absorbing these costs will impact negatively on economic growth in the short and medium term. Battery technology is also developing at a rapid rate and this might provide some solution, but the environmental cost of producing such batteries may well be counterproductive in destroying through toxic waste large tracts of land or destroying ocean environments in search of rare earth battery metals. In short, the GE flatters to deceive, not because it is vein, but because the complexity of realising its potential is underestimated by its friends and supporters.