

The impact of the green economy on jobs in South Africa

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The concept of the green economy has moved beyond the boundaries of environmental economics and into mainstream politics and business in response to the dual problems of global climate change and the economic crisis.¹ It is argued that a green economy will enable environmentally friendly economic and employment growth on the same, or a greater, scale than current environmentally unsustainable growth.¹⁻³ One of the main benefits of green growth is that the jobs it creates tend to have higher local content than traditional fossil-fuel-based economic activities. Energy-efficient investments such as retrofitting buildings tend to be location specific and require local labour.⁴ Most clean energy industries are also more labour intensive than carbon-intensive ones.⁵

Greening the economy is particularly important in South Africa for two basic reasons: (1) the exceptional level of unemployment that the country is experiencing and (2) the high carbon impact of the economy. One of the six priority sectors of the New Growth Path is the green economy because of its potential for job creation. The New Growth Path was conceived in response to the global economic downturn in 2008 and the country's poor record of job growth throughout the 2000s.⁶ The key aim is to steer economic growth towards more labour-intensive industries in order to achieve five million additional jobs by 2020. The 'Green Economy Accord' was signed in November 2011 by representatives from four stakeholder groups – government, private business, labour unions and civil society. The main aim of this initiative is to create a minimum of 300 000 jobs in activities that contribute to greening the economy by 2020.⁷

South Africa also has a 'dirty' economy because of its reliance on cheap coal for electricity generation.⁸ South Africa is the 14th biggest emitter of greenhouse gases in the world, but was ranked 27 in terms of GDP in 2011.⁹ The country is committed to reducing greenhouse gas emissions by 34% by 2020 and 42% by 2025.¹⁰ The Industrial Policy Action Plan and the National Climate Change Response Strategy White Paper outline a strategic plan for improving energy efficiency and developing green industries.

In line with the New Growth Path, the Industrial Development Corporation (IDC) established the Green Industries Special Business Unit in 2011.¹¹ R22 billion will be invested in green industries over the next 5 years. This amount represents almost a quarter of the IDC's total funding. This investment will be disbursed to industries focused on cleaner production methods, cleaner energy generation, increased energy efficiency, pollution mitigation, waste reduction and the development of biofuels. By way of comparison, national government expenditure on general economic, commercial and labour affairs in 2011 was R19.1 billion, with a further R7.9 billion for fuel and energy.¹² Thus the IDC's funding constitutes a substantial investment in the green economy.

Our objective here is to make a preliminary assessment of the potential impact of the green economy on job growth in South Africa. We examine the green job estimates contained in two important reports: the IDC's *Green Jobs: An Estimate of the Direct Employment Potential of a Greening South African Economy* and a report prepared by the Institute for Sustainable Futures entitled *South African Energy Sector Jobs to 2030: How the Energy [R]evolution will Create Sustainable Green Jobs*. These are the most comprehensive assessments of green jobs in South Africa currently available in the public domain. In order to evaluate these estimates, it is necessary to situate them within a conceptual framework that considers the wider implications of a greener economic trajectory.

A framework for assessing green job growth

There is no widely agreed definition of a green job. A strict definition comprises only those jobs in industries and sectors that produce environmentally beneficial goods and services.^{2,13} Broader definitions consider the wider impacts of green growth policies and include indirect and induced jobs. They count jobs created in the supply chains for the products or services of the 'green industries' (indirect jobs) as well as jobs generated out of the spending power of those employed in industries supported by green policy and investment (induced jobs).^{4,14,15} There are potentially negative knock-on or displacement effects of greening as well. Some actors will gain from the green economy, while others will lose. Jobs are bound to be lost in fossil-fuel based industries as a result of greening policies. The balance between job losses in environmentally unfriendly industries and job gains in green industries is an important consideration when calculating the net effect.

The time frame of green job growth is also important. Many jobs may be created in the short term in the construction, manufacturing and installation phases of various green technologies. There is a question around the sustainability of green job growth and how many jobs will be generated over the long term. A potential long-term benefit of greening the economy is innovation. The development of new technologies, industries and processes could provide a whole new range of employment opportunities. The issue of the time frame also applies to costs. For example, the capital costs of solar and wind energy are high, but their longer-term operating costs relatively low.³ Renewable energy is initially more expensive than energy from fossil-fuel sources. By the same token, what may be costly up front can lead to greater savings in the future. For example, greening buildings may be expensive initially, but ultimately leads to savings through greater energy efficiency.

The scale of green intervention must also be considered. Greening strategies can have local, national and international impacts. For example, a programme for distributing solar panels can insist on local manufacture, thereby benefitting not only the recipients of the solar panels, but the local industries producing them as well. If there is no local procurement policy and the panels are sourced from overseas, then foreign industries benefit.

Green jobs estimates

The IDC released its *Green Jobs* report in 2011. It was prepared by 17 primary researchers from three prominent organisations, namely the IDC, the Development Bank of South Africa, and Trade and Industrial Policy Strategies. Many role players from other organisations were also consulted, including the World Wide Fund for Nature, the Green Building Council, the Economic Development Department and private companies involved in green industries. The primary purpose of the IDC report was to

*...provide a segmented view of the net direct job creation anticipated to emerge in the formal economy across a wide range of technologies/activities that may be classified as green or contributing to the greening of the economy.*¹⁶

In determining potential sources of 'green' employment, the IDC identified 26 green segments or technologies which can be grouped into four broad categories: energy generation, energy and resource efficiency, emissions and pollution control, and natural resource management.¹⁶ For example, wind and solar power are two segments of

the energy generation category (see Table 1 which gives a breakdown of jobs estimates for green industries showing the different impacts of each sector or category). A relatively strict definition of a green job has been applied here, i.e. jobs that are created directly through activities that benefit the environment. Also, employment potential is categorised accordingly: building, construction and installation activities; operations and maintenance; and manufacturing. It is conceded that greening the economy is also expected to lead to job destruction in the 'brown economy'. The IDC's estimates are said to be calculated on a net basis, taking into account expected job losses elsewhere within each of the broad categories. For example, the introduction of bus rapid transit systems under transport in the energy and resource efficiency category is expected to lead to job losses in the minibus taxi and existing bus industries. Different timescales (short, medium and long term) are also considered in estimating the employment potential in each segment of the broad green economy categories. In summary, the short-term (next 2 years) estimate of total net employment potential is 98 000 jobs, and the long-term (next 8 years) employment potential is 462 567 jobs.¹⁶ Natural resource management is predicted to lead to the greatest number of these at 232 926 long-term jobs. Green energy generation is estimated to produce 130 023 long-term jobs, with energy and resource efficiency measures adding another 67 977 long-term jobs.

Table 1: Employment estimates by green economy categories and segments

Broad green economy category	Segment	Technology/product	Long-term net direct employment	Long-term net direct manufacturing employment		
Energy generation	Renewable (non-fuel) electricity	Wind power	Onshore wind power	5156	2105	
			Offshore wind power			
		Solar power	Concentrated solar power	3014	608	
			Photovoltaic power	13 541	8463	
			Hydropower	Marine power	197	0
				Large hydropower	272	111
	Fuel-based renewable electricity	Waste-to-energy	Landfills	1178	180	
			Biomass combustion	37 270	154	
			Anaerobic digestion	1429	591	
			Pyrolysis/gasification	4348	2663	
	Liquid fuel	Biofuels	Co-generation	10 789	1050	
			Bioethanol	52 729	6641	
Biodiesel						
Energy generation subtotal			130 023	22 566		
Energy and resource efficiency	Green buildings	Insulation, lighting, windows	7 340	838		
		Solar water heaters	17 621	1225		
		Rain water harvesting	1275	181		
	Transportation	Bus rapid transport	41 641	350		
	Industrial	Energy-efficient motors	-566	4		
		Mechanical insulation	666	89		
Energy and resource efficiency subtotal			67 977	2686		
Emissions and pollution mitigation	Pollution control	Air pollution control	900	166		
		Electrical vehicles	11 428	10 642		
		Clean stoves	2783	973		
		Acid mine water treatment	361	0		
	Carbon capture and storage		251	0		
	Recycling		15 918	9016		
Emissions and pollution mitigation subtotal			31 641	20 797		
Natural resource management	Biodiversity conservation and ecosystem restoration		121 553	0		
	Soil and land management		111 373	0		
Natural resource management subtotal			232 926	0		
Total			462 567	46 049		

Source: Adapted from Table 0.1 in Maia et al.¹⁶

The second report considers the job growth potential of the energy sector in South Africa across three different scenarios to 2030. The methodology follows that of a global analysis of potential energy sector jobs to 2030 commissioned by Greenpeace International in 2009 and prepared by the Institute for Sustainable Futures at the University of Technology in Sydney, Australia. The three scenarios compared are the Energy [R]evolution scenario (in which South Africa reduces emissions by 60% by 2050), the International Energy Agency (IEA) Reference case (derived from the IEA's 2007 energy projection for Africa) and the Growth Without Constraints scenario.¹⁵ These estimates consider only direct employment. Jobs in the production of energy using various renewable sources are considered, including production, manufacturing, construction, and operations and maintenance. Jobs relating to energy efficiency, coal exports, and the coal power sector are also included. Decline factors have been included to account for the reduction in employment as technologies and techniques mature, as well as job losses in the coal sector. The switch to renewable energy and greater energy efficiency is predicted to lead to 27% greater job growth overall than a 'business as usual' scenario. This prediction amounts to 149 000 more energy sector jobs created by 2030 than in the reference scenario. A further 33 700 jobs could also be created by 2030 in renewable manufacturing. This figure translates to a predicted net increase of 78 000 new jobs by 2030 under the low carbon scenario.

To put these estimates into perspective, the annual increase in formal employment in 2011 was approximately 365 000 jobs.¹² The IDC's short-term (over 2 years) estimate of 98 000 new green jobs represents more than a quarter of this number. Considering that this figure refers to jobs created in a limited number of sectors, the estimate is very substantial. The number of jobs is smaller in the Institute for Sustainable Futures study, but this calculation only considers jobs in energy efficiency and energy generation. Employment change between the first quarters of 2011 and 2012 amounted to an extra 23 000 jobs in mining, 56 000 in transport and 53 000 in agriculture.¹⁷ At the same time, manufacturing lost 81 000 jobs and construction lost 45 000 jobs. Given these figures, the IDC's estimate of over 450 000 new jobs over the next 8 years suggests that the green economy could potentially make a very significant contribution.

Issues in green job estimates

There are several issues with the predictions of these two reports which are common to most estimates of green job growth.⁵ The first is the omission of the costs of the various technologies used. The IDC admits that cost is a critical factor in determining the feasibility of implementing green growth strategies. Related shortcomings are the lack of information on the predicted scale of investment and source of funding for greening growth. The investment costs are not considered in the calculations of either of the green jobs estimates. The scale of investment required to green the economy is such that the bulk of the money is likely to have to come from the private sector.¹ Any public funds paid through increased taxes are likely to have a depressing effect on the economy. Yet costs funded through borrowing could constitute a fiscal stimulus. Public investments in 'green' stimulus packages during the global recession have contributed to a partial economic recovery as well as job creation in the green economy.

The quality of information available for the various segments of the green economy also varies, requiring certain assumptions to be made when calculating the job estimates. Such estimates are based on partial information about greening activities, with information for some sub-sectors of the economy missing entirely.^{2,16} In the IDC report, the possible shift from road to rail transport is mentioned only in passing. While such a shift is expected to substantially reduce greenhouse gas emissions and create employment opportunities, there is simply not enough information available to build this into job growth estimates.¹⁶ Job losses in traditional fossil-fuel-based industries are included in the IDC's estimate, but it is not clear from the report where.

The assumptions underpinning the models used to generate the job estimates are open to debate. The Institute for Sustainable Futures

report warns that the job estimates should be treated as indicative, as many assumptions are built into their calculation. The manufacture of green products such as solar panels and wind turbines is a significant component of the IDC's estimates. Their manufacture also features in the Institute for Sustainable Futures report. A commitment to local procurement is a highly effective way to stimulate green industry.¹ Yet the South African market may not represent sufficient domestic demand to sustain this 'green' manufacturing. The sustainability of the production of wind turbines and solar panels rests on the assumption that the demand in South Africa will be supplemented by demand from other African countries, which may be an interesting idea, but is far from assured. Substantial subsidies may be required for local green manufacturing to succeed, but the government may not have the political will or financial capability to sustain such subsidies.¹⁸

Another problem that extends beyond manufacturing to other areas of the green economy is the lack of a ready supply of sufficiently skilled workers. Job growth in energy efficiency is the most promising benefit for South Africa, because the energy efficiency sector is more labour intensive than traditional fossil-fuel- or renewable-based power generation industries and has a higher demand for less-skilled labour.¹⁴ These requirements fit the local labour market, which consists of a large unskilled labour force.² Many other segments of the green economy, such as solar photovoltaic and smart-grid technology, require technically skilled labour.¹⁹ The dearth of skilled workers in South Africa is a major constraint on the feasibility of these green jobs predictions.¹⁶ Therefore, improved education and skills training is another substantive reform that is necessary for the creation of many of these jobs.²

These limitations and conditions aside, arguably the greatest determinant of green job growth is the regulatory environment. Regulations are such a crucial factor that the estimates of job growth in each segment of the IDC report are followed with key policy implications. The slow pace of revision and development of new regulatory frameworks are identified as major obstacles to the development of the green economy.¹⁶ Poor communication regarding responsibilities within the public sector has also stifled investment in green technology and caused delays in implementation. A common argument is that green growth is no substitute for good growth policies.^{2,3} In addition to add-on green industry programmes, government could do much to stimulate a greener economy through environmental taxation, externality pricing and reducing subsidies for fossil-fuel-based activities in the private sector.

Conclusion

Greening the economy has been shown globally to have great potential to both improve the environment and stimulate growth.¹ This potential is particularly important in South Africa, given our high levels of carbon emissions and unemployment. Estimates for green growth show the potential scale of employment to be promising. There is, however, much uncertainty around these estimates and their underlying assumptions. One of the key issues concerns the size of the stimulus necessary to create sustainable green industries. The extent to which local procurement is emphasised will also have a significant impact on the extent of green job growth. The ability to deliver and implement industrial policy and skills training will also have an impact on green job growth. Finally, how greening growth will be financed is another crucial issue to be considered.

Despite the questions surrounding these estimates, green economic activity does appear to generate more local jobs than fossil-fuel-based industries. Some of the estimates also indicate the potential for significant employment. The figures discussed here therefore represent a promising starting point that warrants further research and policy involvement in greening the economy in South Africa.

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