

Stealing the future: Is South Africa's response to climate change appropriate?

Considering the drought in the Western Cape, Rosalind dos Santos, MSc Eng (Met), BSc Eng (Chem), CEM, evaluates South Africa's response to climate change.

Is South Africa's response to reducing greenhouse gas (GHG) emissions jeopardising the future of young South Africans? Worldwide, civil society has taken greater action against governments that are perceived to not be serving their constituents. There is greater social accountability, and in many parts of the world climate change and the link to anthropogenic GHG emissions is clearly understood and a reduction in national GHG emissions is promoted.

In South Africa, however, we have yet to see the same level of social accountability that is apparent in other countries.

Population pyramids produced by StatsSA, discussing South Africa's demographic dividend, show most of our population under the age of 35. This young population will feel the first real effects of climate change that result from our inaction.

Climate change risk

The clear lack of priority given to environmental and climate-related risks in South Africa is evident when comparing the World Economic Forum (WEF) Global Risk Report and the Institute of Risk Management South Africa (IRMSA) Risk Report. In the WEF Global Risk Report, Extreme Weather Events, Natural Disasters and Failure of Climate Change Mitigation and Adaptation risks are consistently high ranking from 2015 onwards, making up three of the top five risks in terms of likelihood and impact. On the other hand, the risk of Droughts in Sub-Saharan Africa is the only environmental risk identified in the IRMSA Risk Report. This risk is present in the mid-2016 and 2017 risks, ranking 4th in the top five risks in terms of likelihood, 1st in terms of impact in mid-2016 and 3rd in terms of impact in 2017. In all other years, environ-

mental and climate-related risks are absent from the IRMSA Risk Report.

In the latest Intergovernmental Panel on Climate Change Assessment Report 5, the climate change affected areas highlighted for Southern Africa are terrestrial ecosystems, livelihoods, health and/or economics. Further, there is high confidence that those living in poverty will feel the impacts of climate change, exacerbating other stressors in their lives. This is particularly relevant in South Africa where 56.8% of people live in poverty. Thus, there appears to be environmental, social and economic motivations to act to reduce GHG emissions.

The risk reports show that although climate change may be top of mind globally, it is not for South Africa. South Africa's energy supply and associated economic activity is heavily reliant on its large coal resources. Focusing on reducing GHG emissions in South Africa would require a move away from coal, impacting our energy supply and economic activity. As such, there seems to be a financial incentive for South Africa to exploit fossil fuel resources and extend the timeline before climate change is dealt with.

An exception to this is renewable power generation, with the cost of solar photovoltaic (PV) and wind energy below the cost of non-renewable energy. Nonetheless, the electricity generation grid remains predominantly coal-fired power generation at 90% of Eskom's power generation.

Whilst South Africa is a developing country, our per capita GHG emissions are higher than the global average (6.249 t of CO₂e versus 4.936) and much higher than many other developing countries. As mentioned, this is largely due to our dependency on coal for energy, with energy being responsible



With rainfall lower than the world average, already water stressed South Africa is at risk of being unprepared for the severe water shortages to come.

for 78.7% of our latest country-level carbon footprint in 2010 (excluding forestry and other land use carbon sinks).

Are we already seeing the result of climate change bearing in mind that a single weather event does not demonstrate climate change? Water risks, both in terms of availability and quality, came to the fore in 2017 and will continue to be a key and high-ranking risk over the five-year horizon in many parts of South Africa. Two large municipalities are currently declared as disaster areas due to extreme water shortages, and this is one of the key climate change predictions: that Africa will become dryer. With lower than world average rainfall, South Africa is already water stressed and the key link of water in the energy sector (for steam production to turn turbines, to generate electricity or in the refining of oil for liquid fuels) should not be overlooked in terms of economic, environmental and social impact.

Possible solutions

The National Climate Change Response Strategy proposes using emission trajectory plans, sector emission reduction outcomes, carbon budgets, economic instruments and better data and information gathering, but was last published in 2011. Further, the Intended Nationally Determined Contribution presented by the South African government in Paris was vague in terms of South Africa's binding commitments. Now in the Nationally Determined Contribution, the emissions targets are within the range of 398 to 614 Mt CO₂e, which is quite a broad target and planned emission reductions are only envisaged from 2020. In addition, our emissions from our last GHG inventory

are already within the range and it seems likely we could make the 2025 to 2030 target possible without any additional emissions mitigation.

The latest development in terms of economic instruments is the South African carbon tax bill that will probably soon be passed. However, whether this is an environmental levy or an instrument to further close the tax gap – estimated at R90-billion for this fiscus – is still in question.

Thus, while there are several frameworks that have been conceived and can be rolled out, whether these are enough and significant

for our contribution to the global problem may be questionable.

There may also be more effective market solutions. Renewable energy generation technologies, cost-effective battery technology and electric vehicles may give forward thinking governments the ability to manage and reduce GHG emissions. The ability to respond in an agile way to these technology disruptors will be an important component for South African climate change mitigation and adaptation.

An important positive item to note here, however, is the launch of the South African Risk and Vulnerability Atlas and the accompanying African lead submission for climate modelling into Assessment Report 6. This speaks volumes for our National Science and Technology; and will hopefully translate into clear and effective climate policy that is not overly detrimental to the economy.

As chemical and metallurgical engineers, there is a great opportunity to design efficient, environmentally responsible plant, processes and production. We should also be using our knowledge and experience to create awareness of these issues in our daily interactions. Over engineering that often comes with excessive energy use should be regularly questioned and challenged. Opportunities to meet design and client briefs in more long term and future forward ways – considering operating costs, emissions and resource use – should be taken wherever possible. Small changes to designs to minimise energy, water and waste will have a large impact over the operating lifetime of the plants and processes that we design. We should also look to nature

and biomimicry and the many advances that are coming from this field that allow us to make so much more, from less.

The scale and impact of climate change is not fully understood by all South Africans, and thus there is a potential risk for the country of being unprepared for changed weather patterns and climate. While the South African government has some policies and instruments in place to mitigate climate change effects and reduce emissions, we may be stealing the future from our youthful population by failing to act more decisively.

Similarly to how South Africans are only now feeling the consequences of the poor planning for the water shortages, so too will the future generations feel the consequences if we do not act now to mitigate the risk of climate change. □

For a list of references see online article www.mechchemafriamagazine.co.za

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The views expressed in this article are her own, informed by experience, literature review and other expert opinion pieces. Please feel free to write to the editor about your thoughts on climate change. □

