"First, do no harm"? An overview and ethical evaluation of South Africa's climate change mitigation commitments in light of the Paris Agreement

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Abstract

South Africa ratified the Paris Agreement in 2016 and thereby committed to reducing Greenhouse Gas (GHG) concentration levels as part of its self-determined goals in its Nationally Determined Contribution (NDC). This article viewed the targets in the NDC through an ethical lens. It was demonstrated that the commitment below the 'business-as-usual' (BAU) level allowed for large increases in South Africa's emissions without explaining how these were consistent with a specific understanding of what equity required. Also, the NDC targets were found to be highly insufficient. Consequently, South Africa's climate change mitigation commitments were deemed inconsistent with the ethical 'no-harm' principle.

1. Introduction

South Africa ratified the Paris Agreement on Climate Change in 2016 and thereby committed to reducing Greenhouse Gas (GHG) concentration levels as part of its self-determined goals in its Intended Nationally Determined Contribution (INDC). When South Africa ratified the Paris Agreement, the INDC (which was previously submitted in 2015) was converted into the Nationally Determined Contribution (NDC). It is the latter document to which we refer in our analysis. In this article, we view the targets in the NDC through an ethical lens, by evaluating South Africa's climate change mitigation commitments under the 'first, do no harm' principle.

The article commences with a brief historical overview of the evolution of climate change agreements from the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, to the current Paris Agreement. This is followed by

an exposition of ethical principles in the context of climate change. Next, we analyse South Africa's commitment to limit carbon emissions by evaluating the country's policy responses, national carbon budget and NDC targets. The article concludes with an appraisal of South Africa's climate change mitigation commitments.

2. Historical orientation on climate change agreements: From Rio (1992) to Paris (2017)

The UNFCCC is an international environmental treaty that was produced at the UN Conference on Environment and Development (informally known as the Earth Summit) in Rio de Janeiro in 1992. This treaty took effect in 1994 and attempts to embrace the interests and needs of all countries.

The Kyoto Protocol from 1997 elaborates on the UNFCCC by placing more specific obligations on developed countries and Countries with Economies in Transition (Glazewski & Du Toit, 2016:para 3.2.2.1). Essentially, the Kyoto Protocol translated the UNFCCC into a specific action plan. Annex I countries (i.e. developed economies) were obliged to reduce their overall emissions of six GHGs by at least five per cent below 1990 levels between 2008 and 2012 (the first commitment period) (Glazewski & Du Toit, 2016:para 3.2.2.1).

Non-Annex I countries (i.e. developing economies) were not required to make any comparable cuts unless they chose to do so (Glazewski & Du Toit, 2016:para 3.2.2.1). Thus, although South Africa is a non-Annex I country in the Kyoto Protocol, it is a signatory. It had ratified the Kyoto Protocol on 31 July 2002, but as a developing country, does not have targets under the protocol.

The underlying concern of the UNFCCC is that the earth's climate system is threatened by a rise in atmospheric GHG concentrations resulting from increased anthropogenic GHG emissions (Blodel, Meyer-Ohlendorf, Schlosser-Allera & Steel, 2006:21), as reflected in its ultimate objective to 'achieve, in accordance with the relevant provisions of the Convention, stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [originating in human activity] interference with the climate system' (UNFCCC, 2002:Art 2). This objective is qualified in that food production should not be threatened and that economic development should be able to proceed in a sustainable manner.

We are now at a critical juncture in the climate change timeline, when policymakers, academics and other climate-related stakeholders are contemplating the transition from the Kyoto era to the advent of the landmark Paris Agreement which came into force on 4 November 2016. South Africa had ratified the treaty on 1 November 2016.

The main achievement of the Paris Agreement is that consensus was reached to confine global GHG emissions to a limit that will ensure that the planet's global temperature will not increase by more than 2°C above pre-industrial levels. As a primary step towards meeting this target the Paris Agreement obliges parties to prepare, communicate, and

maintain successive NDCs with the aim of achieving the objectives of the UN Framework Convention on Climate Change (UNFCCC). Each NDC represents a nation's voluntary commitment to pursue actions, policies and regulations deemed necessary to achieve a self-determined goal to mitigate GHG emissions and adapt to a changing climate (Crowell & Moring, 2015).

The Paris Agreement articulates two long-term emission goals: first, a peaking of emissions as soon as possible, followed by a goal of net GHG neutrality in the second half of this century. In respect of the first goal, the Centre for Climate and Energy Solutions (CCES) (2015:3) remarks that the Paris Agreement recognises that it will take longer for developing countries; as regards the second goal, this neutrality is expressed as 'a balance between anthropogenic emissions by sources and removals by sinks'.

The agreement commits parties to 'pursue domestic measures with the aim of achieving the objectives' of their NDCs (Paris Agreement, 2015:Art 4(2)), but does not make the implementation or achievement of NDCs a binding obligation (CCES, 2015:3). It also encourages, but does not require, countries to develop and communicate long-term low-emission development strategies.

The core mitigation commitments are common to all parties, but there is some differentiation in the expectation set: developed countries 'should' undertake absolute economy-wide reduction targets, while developing countries 'are encouraged' to move towards economy-wide targets over time (Paris Agreement, 2015:Art 4(4)). In addition, developing countries are to receive support to implement their commitments (Paris Agreement, 2015:Art 4(5)). The wording of this section of the Paris Agreement echoes one of the key concepts underlying the UNFCCC, namely that of 'common but differentiated responsibilities', as introduced in Art 3(1) of the UNFCCC. It reflects the argument that developed countries have greater responsibility for the (then) current level of GHG in the atmosphere attributable to their past economic growth and should, accordingly, accept greater responsibility for solving the climate change problem.

The UNFCCC acknowledges that, on a per-person basis, developing countries contribute 'only a small portion' of GHG emissions (UN Climate Change Secretariat, 2007:3). Furthermore, it is recognised that the particular needs of developing countries in adapting to climate change is of critical importance, as the problem of climate change is interlinked with development, i.e. economic growth is essential for developing countries to improve the health, economic livelihood and quality of life of their citizens (UN Climate Change Secretariat, 2007:3). The challenge, therefore, is to sever the link between economic development and GHG emissions.

It is evident that the causes and effects of climate change are global and require 'complex collective action' (Bodansky, Brunée & Rajamani, 2017:2). The conundrum lies in getting countries to operate not only in their own best interest, but also for the good of all (Bodansky *et al.*, 2017:3). The authors explain that significant investments to reduce GHG emissions will only be in a country's individual self-interest if they are reciprocated by other states.

Thus, the problem of climate change can only be dealt with if all states – or at least the major GHG-emitting countries – overhaul their energy production and consumption (Bodansky *et al*., 2017:2) in search of the global good instead of short- and medium-term national good.

The question then arises as to what ethical guidelines could foster such a global commitment to mitigate the cumulative impact of climate change?

3. "First, do no harm" in the context of climate change

Ethical questions related to climate change are primarily concerned with issues of distributive and restorative justice. Thus, how should the burden of mitigating climate change be equitably distributed and who is ethically responsible for the past damages caused by climate change?

The answers are not readily available due to a lack of consensus about what equity and climate justice entail. This is because some focus on historical responsibility and others on duties to future generations (Bodansky *et al*., 2017:7). Also, some concentrate on a fair division of burdens based on current means, while others adhere to the egalitarian principle that people have an equal right to atmospheric space (Bodansky *et al*., 2017:8).

If one approaches climate ethics from a deontological perspective (Shaw, 2011:60-67) the question arises as to which principles should constitute our obligations and guide our actions? In this context, O'Hara & Abelsohn (2011:27) suggest four principles:

- The principle of non-maleficence ("first, do no harm"), which is sometimes stated as *primum non nocere*;
- The principle of equity;
- The principle of distributive justice; and
- The principle of free and informed consent.

The focus of this article is on the 'no harm' principle. For the purpose of this article, it is deemed sufficient to state that the principles of equity and distributive justice are closely related, as both deal with the fair and just distribution of benefits and burdens within a society (O'Hara & Abelsohn, 2011:28). In their simplest form, they may be explained as stating that each person has an equal but limited entitlement to emit GHG (O'Hara & Abelsohn, 2011:29). Similarly, while any single entity or nation can discharge GHGs into the atmosphere, the potential climate effects will be experienced by all (O'Hara & Abelsohn, 2011:29).

The principle of free and informed consent flows from the 'no harm' principle (which is discussed in more detail next), i.e. no country may put another country or its peoples at risk without the knowledge and consent of the latter (O'Hara & Abelsohn, 2011:35). This principle confers on all nations who are at risk from the effects of climate change, the right to participate fully in discussions regarding risks and responses (O'Hara &

Abelsohn, 2011:36). In other words, every person or representative nation must have a voice in formulating responses to climate change issues, and there must be transparent information on each country's actions in this regard.

Let us now shift our focus to the principle of "first, do no harm". This maxim is well-known in bio- and medical ethics and attempts to regulate physicians' interventions on the basis that the primary ("above all" or "first") consideration should be to act in such a way that no foreseeable harm is caused for the patient (Smith, 2005). When transferred to ecological ethics and the specific matter of climate change mitigation, it suggests that each country should take as primary guide not to act in such a manner that it may cause foreseeable harm to its own communities, other countries and, by implication, to the global community, which includes future generations.

The 1992 Rio Declaration on Environment and Development carried the notion that each person has a fundamental and primary obligation to avoid doing harm to others into the climate ethics discussions. In that same year, nations who ratified the UNFCCC agreed to the 'stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system' (UNFCCC, 1992:Art 2). By ratifying the UNFCCC, these nations have acknowledged the normative force of the 'no-harm' principle (Gilder *et al.*, 2016:7-10).

Consequently, it can be argued that these parties have a moral and legal obligation to prevent their GHG emissions from rising to levels that will create serious harm to others (Gilder *et al.*, 2016:7-9). It is important to note that – as forcefully argued by eco-feminists – the object of the no-harm principle exceeds other human beings to include the ecosystem and other non-human species (Swanson, 2015).

Following on this, any national target may be viewed as an implicit position on a 'satisfactory' and morally acceptable concentration of atmospheric GHGs (Gilder *et al.*, 2016:7-9). This is based on the premise that all GHG emissions have the potential to contribute to atmospheric GHG concentrations (Gilder *et al.*, 2016:7-9). At its core, the targeted concentration level is an ethical issue because the level that is chosen will determine the proportion of harm or not that is experienced by vulnerable people and the ecological systems on which they depend (Gilder *et al.*, 2016:7-9), as well as the contribution to global GHG concentration levels.

A related concern is that the harmful effects of climate change are in violation of a number of key human rights, including the rights to life, equality, human dignity, and an environment that is not harmful to a person's health or well-being (Gilder *et al.*, 2016:7-10). The Universal Declaration of Human Rights was proclaimed by the UN General Assembly in Paris in 1948. It was the first time that fundamental human rights were to be universally protected. Many decades later, at the COP16 in Cancun in 2010, Parties agreed that all climate change related actions should fully respect human rights (UNFCCC, 2011). Failure to do so could result in catastrophic events. Indeed, the Global Humanitarian Forum (GHF) ascribes 300 000 human deaths per year to climate change (GHF, 2009:11). Other human rights that are sometimes violated include the rights to

self-determination, water, an adequate standard of living, adequate housing, education and property (Gilder *et al.*, 2016:7-10).

All of the foregoing concerns should, from an ethical point of view, influence how nations commit themselves to GHG reduction targets. To that end, the next section focuses on the specific issue of a global "carbon budget" and evaluates South Africa's climate change mitigation pledges in the context of the Paris Agreement and in relation to the "first, do no harm" principle.

4. Limiting GHG emissions in terms of a global carbon budget

Countries respond to climate change through mitigation and/or adaptation efforts. The former is interested in preventing climate change, while the latter pertains to adjusting to climate change in order to limit its harmful effects. To word it differently, while mitigation consists in addressing the causes of climate change by, for example, reducing the emission of GHGs, adaptation means coping with the negative resultant effects of climate change, for example, developing more heat-resilient crops (Jagers & Duus-Otterström, 2008:577).

The first step in a mitigation strategy is to establish a carbon budget. A carbon budget can be defined as a 'tolerable quantity of GHG emissions that can be emitted in total over a specified time' (WWF, 2014:2). Not to be confused with the use of targets, thresholds or emission-reduction targets, a carbon budget represents a finite limit to the amount of emissions which can be allowed before humans run into disastrous climate change (WWF, 2014:2).

The Intergovernmental Panel on Climate Change (IPCC) posited in 2014 that in order for the planet to have a 50 per cent chance of avoiding a dangerous global average temperature rise of 2°C or more above pre-industrial levels, GHG concentrations must stabilise at 450 parts per million (ppm) CO_2 equivalent (CO_2e) (IPCC, 2014:20). A recent update to this study (which includes global CO_2 emissions in 2016) alarmingly concludes that four years of current emissions would be 'enough to blow what's left of the carbon budget' for a good chance of keeping global temperature rise to 1.5°C (Carbon Brief, 2017).

A study commissioned by the WWF set the desired concentration limit at 400 ppm CO_2e in order to improve the chance (66 per cent likelihood) of staying below 2°C of global warming. The study translates this ppm limit into a global carbon budget for the period 1990 to 2100. The year 1990 was selected as the start year because the Kyoto Protocol allows for emission reduction targets against 1990 emission levels.

The study concludes that collective emissions may not exceed 1600 $GtCO_2$ over the period 1990 to 2100 (Höhne & Moltmann, 2009:5). Due to significant emissions in the last 20 years, the remaining budget is approximately 870 $GtCO_2e$ from 2009 to 2100, after which we need to approach zero net emissions (Höhne & Moltmann, 2009:11).

The carbon budget is a global one, because of one shared atmosphere. However, economic activity (which causes emissions) is located within countries and sectors, which result in many different ways of dividing the budget up amongst countries. The overall budget, though, cannot change substantially. Therefore, if one country increases its emissions, another country will have to reduce its emissions to compensate.

The remaining carbon budget is a scarce resource which must be divided fairly between countries (WWF, 2014:5). Issues that come into play in this debate include (WWF, 2014:5):

- responsibility for historical emissions;
- state of economic development and the right to be able to develop to a certain level;
- size of population and per capita emissions; and
- financial, technological and other capacity to reduce emissions.

These issues are the subject of ongoing political negotiations between states and contribute to tension between developed and developing countries. At the heart of this debate is the viewpoint that developed countries have been industrialised for longer and have historically been emitting GHGs that have built up to today's concentrations in the atmosphere (WWF, 2014:5).

Developing countries also contend that they should be allowed to emit so as to continue their own economic development (WWF, 2014:5). As such, we now shift our focus to South Africa in order to consider this country's commitment to limiting carbon emissions.

5. South Africa's commitment to limit carbon emissions: a critical analysis

5.1 South African policy responses to climate change

The South African government through its lead agent for South Africa's climate change response – the Department of Environmental Affairs – has recognised its responsibility to curb GHG emissions and has accordingly put a number of policy and legal measures in place, thereby crystallising South Africa's obligations under the UNFCCC. These include the *National Climate Change Response Strategy for South Africa to Address Climate Change* (NCCRS) (Department of Environmental Affairs, 2004), the *National Climate Change Response White Paper* (NCCRP) (Department of Environmental Affairs, 2011) and Chapter 5 'Environmental Sustainability and Resilience' of the National Development Plan (NDP) (National Planning Commission, 2011).

The NCCRS outlines the steps that should be taken by government and other role players at a national level to respond to climate change. These include the establishment of a national inventory of GHGs, the Long Term Mitigation Scenario (LTMS) and the Technology Needs Assessment (TNA) Report. The LTMS project informed South Africa's long-term climate policy as well as contributing to South Africa's negotiating position in terms of the UNFCCC (Winkler, 2007). The TNA can be used by developed countries

as a means to cooperate with developing countries in order to meet their obligations in terms of technology transfer with respect to climate change (Department of Science and Technology, 2007:v).

The NCCRP builds on the NCCRS report by conveying the South African government's vision for an effective climate change response via two overarching objectives, namely to effectively manage climate change impacts and to stabilise GHG concentrations. Although the NCCRP indicates South Africa's commitment to making a fair contribution to the global effort in reducing GHG emissions, it does so against the 'overriding national priorities' of, amongst others, sustainable development, job creation and poverty eradication (Kotzé *et al.*, 2016:1-6). In other words, the NCCRP promotes mitigation measures to effect sustainable development in socio-economic, as well as environmental terms.

Generally speaking, the NDP sets out a vision until 2030 for South Africa's energy sector, including a reference to environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change (National Planning Commission, 2011). The NDP supports procurement of at least 20 GigaWatt (GW) of renewable energy by 2030 in its outline of the country's development path (Greencape, 2016:22).

Other policies emanating from the NCCRP are, for example, the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) of 2009, and the *White Paper on the Renewable Energy Policy* (Department of Minerals and Energy, 2004). South Africa's REIPPPP was amongst the programmes identified as a climate change flagship programme in the NCCRP. The White Paper recognises that the development of fiscal, financial and legislative instruments will be required to stimulate the increased use of renewable energy technologies (Department of Minerals and Energy, 2004:27). One example of a fiscal instrument, is a carbon tax.

South Africa already makes use of two specific carbon taxes, namely an electricity levy and a CO_2 emissions levy on new motor vehicles imported into or manufactured in South Africa. Following recommendations from energy scholars, the South African government has proposed the introduction of a comprehensive carbon tax. It is anticipated that the carbon tax will come into effect in a phased manner at a marginal rate of R120 per tCO_2e in 2019. Parties that conduct various activities in the manufacturing, construction, mining and transport sectors will be affected. For an exposition of the key features of the carbon tax, as well as fiscal incentives for renewable energy, see Steenkamp (2017).

South Africa's climate change and energy policies informed the foundation for its targets under the NDC, which is examined next.

5.2 The nationally determined contribution (NDC)

According to the International Energy Agency (IEA), South Africa is amongst the top 25 GHG emitting countries globally, and accounts for more than one-third of the total energy-related CO_2 emissions on the African continent (IEA, 2015:64). With the

exception of Russia, South Africa also outranks the other BRICS member countries on a per capita basis.

According to the World Bank (2017), CO_2 emissions for 2014, measured in metric tons per capita, were as follows: Brazil (2.6), Russia (11.9), India (1.7), China (7.5) and South Africa (9.0). Of course, India and China have much larger populations than South Africa (thus resulting in a lower per capita ranking). However, South Africa's ranking is a cause for concern and its climate change pledges under the Paris Agreement – as espoused in its NDC – have to be viewed through a critical lens.

The South African NDC (South Africa, 2016:6) targets a reduction in GHG emissions of between 398 and 614 $MtCO_2e$ over the period 2025 to 2030. The country's NDC is consistent with its pledge under the Copenhagen Accord, which proposes emissions reductions below business-as-usual (BAU) levels by 34 per cent in 2020 and 42 per cent in 2025. The NDC also highlights the fact that economic and social development as well as poverty eradication are South Africa's top priorities.

The carbon budget emanating from South Africa's NDC pledge should be viewed in conjunction with estimates put forward by other prominent stakeholders. This benchmarking exercise is done in the next paragraph.

5.3 Setting South Africa's carbon budget

The configuration of South Africa's carbon budget is the subject of ongoing debate and varies depending on stakeholders' interests. Table 1 below offers an overview of a number of estimates for the country's carbon budget, ranging from fairly conservative to rather ambitious. Note that the NDC's carbon budget only covers the years 2021 to 2030, while the other estimates span a longer period.

Table 1: South Africa's carbon budget estimates

Estimate (in $GtCO_2e$)	Period	Stakeholder	Source
9–16	2009–2050	WWF	Höhne & Moltmann (2009)
7–11	2000–2049	BASIC countries report	Winkler *et al.* (2011)
15–23	2010–2050	NCCRP	Department of Environmental Affairs (2011)
10.2	2011–2050	South African Corporate Leaders Group on Climate Change	Brown & Cutifani (2011)
1.99–3.01 1.99–3.07	2021–2025 2026–2030	NDC	Department of Environmental Affairs (2015)

The last official GHG inventory for South Africa was for the year 2000. Total emissions were found to be at 421 $MtCO_2e$, accounting for approximately one per cent of global emissions (WWF, 2014:12). Based on an average carbon budget of 10 $GtCO_2e$ to be emitted from 2011 to 2050, and an estimated emissions rate of 450 $MtCO_2e$ per year, South Africa has less than 23 years before having to cease CO_2 emissions (WWF, 2014:13).

In the absence of an international agreement on dividing up the global carbon budget, South Africa has derived its own carbon allowance for the period 2010 to 2050. The apportionment of this carbon budget is discussed in the next paragraph.

5.4 Apportioning the carbon budget

When determining how to apportion the carbon budget, two approaches are used. The first is a resource-sharing approach, wherein a country could give economic sectors each a share of the national carbon budget (WWF, 2014:8). Thus, it is a top-down approach working down from an overall budget and sharing it out (WWF, 2014:8).

The second is an effort-sharing method, where targets for reducing emissions are set (WWF, 2014:8). This bottom-up approach is more risky, because there is no guarantee that if all the emissions reductions are added, the country will still be within its carbon budget (WWF, 2014:8). The emissions targets can be set by reference to either a 'base year' or a 'base line'. South Africa has adopted the latter approach.

Box 1 below illustrates the difference between the base year and base line approaches (derived from WWF, 2014:8).

Box 1: Base year vs. Baseline

- **Base year**: emissions are cut down from the measured emissions in a certain base year in the *past*. The UNFCCC looks at cuts relative to 1990 levels. A base year target is an *absolute* reduction, for example 'cut 30% compared to 1990 level by 2030'.
- **Baseline**: climate change models predict what emissions will be in *future* years, if no action is taken to reduce them, This yields a hypothetical baseline, often referred to as the 'business-as-usual' (BAU) line. Cuts are made down from the levels described by the BAU trajectory. A BAU target is a *relative* reduction, for example 'cut 34% below BAU by 2020'.

From the above illustration, it is evident that a BAU approach results in shifting targets. This is because baselines by their nature are projections and thus open to manipulation (WWF, 2014:10). For example, it might be in the interest of a particular stakeholder to artificially inflate the baseline projections. Thus, if growth in the baseline is high and percentage reduction is modest, a reduction against the baseline may still allow growth in emissions in absolute terms (WWF, 2014:8). This is the main concern with South Africa's commitments in its NDC, as outlined next.

5.5 BAU levels

South Africa's commitment to reduce emissions by 34% and 42% below BAU are based upon the LTMS. However, the LTMS does not explicitly state how its commitments will achieve any safe atmospheric concentration goal (Gilder *et al.*, 2016:7-16). Notwithstanding that the LTMS acknowledges the need to limit global warming to 2°C, no explanation is provided as to how national emissions reductions might relate to any quantitative global carbon budget goal (Gilder *et al.*, 2016:7-16). Thus, despite acknowledging that national commitments must be based on equity and acceptable warming limits, South Africa does

not explain how the specific GHG emissions reductions commitments were derived or influenced by ethical principles, such as historical or per capita emissions.

In fact, because the South African target is based on a commitment below BAU – and not a particular year's emissions as a base year – it allows for large increases in the country's GHG emissions by 2020 and 2025 without explaining how these increases are consistent with a specific understanding of what equity requires. The risk exists that by basing a target on BAU levels determined in, say, 2020 this would result in no actual reductions in 2020 from actual emissions.

Consider the following example, derived from Gilder *et al.* (2016:7-17): BAU emissions in South Africa rise by 50% by 2020. A 32% reduction commitment below BAU amounts to an increase of 18% above current emissions. This is clearly not an emission reduction commitment from existing levels at all.

As a consequence of committing to below BAU levels, the targets in the NDC are considered to be insufficient, as detailed below.

5.6 Insufficient target

Notwithstanding that the South African NDC assumes the finalisation of an ambitious, fair, effective and binding multilateral agreement under the UNFCCC at COP21, it also underscores the fact that economic and social development and poverty eradication are South Africa's top priorities (South Africa, 2016:3;7). Probably the most revealing statement is on page 8 of the NDC:

> In the absence of a multi-laterally agreed equity reference framework, South African experts, applying Convention principles of responsibility, capability and access to equitable sustainable development, determined a carbon budget that is larger than the PPD trajectory range outlined in this INDC. South Africa has used this evidence base to evaluate whether its INDC is a relative fair effort. In the context of this *objective assessment South Africa is of the view that its contribution is both fair and ambitious.* [own emphasis]

The WWF (2015) cautions that while all the other statements in the NDC can be backed by publicly available research and national policy, South Africa has declined to disclose this analysis or even the identity of the experts, which undermines the credibility of this claim. It is therefore questionable how 'objective' the country's assessment is and whether its contribution is indeed 'fair and ambitious'.

Moreover, the estimates used in the NDC implies that South Africa would have to bring its emissions down considerably after 2030, as we would have used up half of our carbon budget by then. We agree with the caution expressed by the WWF (2015) that 'it would serve the country's developmental agenda better, and minimise economic shocks, to aim lower and decline sooner'.

Climate Action Tracker (CAT) – an independent, global scientific consortium – regards South Africa's NDC as 'highly insufficient', as the target falls outside the fair share range

(CAT, 2018). The NDC target is not consistent with holding warming to below 2°C – let alone with the Paris Agreement's stronger 1.5°C limit (CAT, 2018). Alarmingly, this rating implies that if all government targets were in this range, warming would reach between 3°C and 4°C.

5.7 Concluding remarks on South Africa's NDC target

Despite the plethora of climate change mitigation policies mentioned earlier and a strong renewable energy target, South Africa's coal-fired electricity generation is still expected to grow, with new coal plants either planned or under construction. To worsen matters, the flailing state-owned grid operator Eskom stalled the signing of independent power purchase agreements with renewable energy companies and may yet face further opposition from mine workers unions (Ensor, 2018). Moreover, the implementation date for South Africa's planned carbon tax remains uncertain.

If South Africa experiences stronger economic growth rates leading up to 2030, emissions levels under its current policy trajectory are likely to increase (CAT, 2018). The NDC pledge requires a flattening of emissions post-2025. Consequently, it is unlikely that South Africa will remain within its carbon budget.

Although the South African NDC (2016:6) acknowledges that climate policies need to be guided by ethical principles, it does not describe quantitatively how this was accomplished in deriving the carbon budget. In other words, South Africa's actual emissions reduction target does not explain how it is quantitatively linked to an atmospheric warming or the country's fair share of safe global emissions.

Consequently, the NDC could create the impression that economic self-interest influenced the country's actual commitments. This is perhaps most evident from the assumptions stated in the NDC (on page 7), where it is asserted that the achievement of South Africa's targets is contingent on getting financial support from developed countries. In sum, the NDC does not explain how its target emissions reductions are consistent with any equity framework that could be applied universally.

In terms of the "first, do no harm" principle, we infer that South Africa's commitment to mitigate climate change in the specific instance of GHG emissions, falls short of the ethical injunction to not harm its own citizens, neighbouring countries, and – by implication – the global community over the medium to longer term.

6. Summary and concluding remarks

South Africa ratified the Paris Agreement in 2016 and thereby committed to reducing GHG concentration levels as part of its self-determined goals in its NDC. This article viewed the targets in the NDC through an ethical lens. It was demonstrated that the commitment below the BAU level allowed for large increases in South Africa's emissions without explaining how these were consistent with a specific understanding of what equity required. Also, the NDC targets were found to be highly insufficient.

Climate change mitigation requires a multi-pronged approach, with business, society and government working together. To that end, we concur with Brown and Cutifani (2011) that business leaders should support continued scientific research as well as engaging constructively with government and civil society in South Africa to develop a plan for reducing South Africa's emissions while continuing to deliver on our social goals.

We submit that care should be taken to ensure that South Africa's emissions reduction target is strengthened to reflect South Africa's responsibility to act based on its historical emissions, as well as the country's comparatively high emissions per capita. As South Africa continues to formulate and refine its climate change policies, the country arguably needs to be guided by ethical and justice issues that are global, but also uniquely South African. As matters stand today, South Africa – despite laudable policy initiatives – has not struck the right ethical balance between self-interest and the global common good.

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