

## **Response Sasol's note headed:**

Sasol's development of a new greenhouse gas emissions outlook for South Africa: assumptions and data.

### **Origin of Sasol's note.**

Sasol's note is intended to substantiate slide 14 in Sasol's presentation to the Davis Tax Commission (DTC). That slide gave the following source:

Source: Sasol. 2015. Development of new emissions outlook Sasol calculations based on data from the DEA: Mitigation Potential Analysis. Sasol.

The style of this reference suggested that there was a full paper, authored by Sasol, in which it documented its calculations to show how it came to produce slide 14 using data from the Department of Environmental Affairs' (DEA's) Mitigation Potential Analysis (MPA). We therefore asked for the paper. Sasol responded by inviting us to meet with them. It took the exchange of six emails (three aside) to establish that: 'The reference to Sasol 2015 in the DTC slides refers to our internal calculations and not a report.'<sup>1</sup>

We think the referencing and the title ('Development of new emissions outlook') was intended to suggest something more authoritative than 'internal calculations'.

The email continued: 'Our calculations which rely on the MPA and GHG inventory also incorporate third party information which we are obliged to keep confidential.' And it repeated the invitation to meet with us and 'make available the assumptions' behind its calculations.

We responded thus: 'We cannot meet Sasol for backroom discussions on calculations that have not been put into the public domain. Sasol has made assertions in public fora to influence policy on a matter of great public interest but refuses to make the basis for those assertions open to public scrutiny.'<sup>2</sup> And we rejected the claim to confidentiality as we believe corporate and plant level emissions (of GHGs and all other pollutants) should be a matter of public record.

Sasol then replied that 'we can provide some information and clarity to you without breaking confidentiality'.<sup>3</sup> They sent us this note two weeks later. It is striking that the note does not mention third party information under 'data sources'.

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<sup>1</sup> Email correspondence 25 June 2015.

<sup>2</sup> Email correspondence 26 June 2015

<sup>3</sup> Email correspondence 1 July 2015.

## Objectives

As far as we are aware, Sasol uses Slide 14 for the first time in its presentation to DTC. The presentation argued that South Africa should not make any firm mitigation offers at the Paris negotiations, that it is already doing enough and that a carbon tax is a bad idea.

Slide 14 itself says: 2010 emissions were 518 Mt; ‘electricity emissions remain flat until 2021 when Medupi and Kusile are fully online’; other sectors grow at 50% of the rate assumed in the MPA study; business-as-usual growth rates in emissions resume in 2021.

This slide was also used by Business Unity South Africa (BUSA), who led the call for a hearing on the carbon tax at the DTC but declined to put their presentation on the DTC website. The Chemical Allied Industries Association (CAIA) and the Chamber of Mines (CoM) both declare support for BUSA’s positions. The repeated message in all cases is that South Africa is ‘below target’ and cannot afford to do more.

Sasol is CAIA’s largest affiliate and CAIA is often regarded as its surrogate. BUSA’s climate person is the former director of CAIA and has a long history of close association with Sasol. In its presentation to DTC, CAIA states blankly: ‘CAIA does not support South Africa’s continued development of climate change policy, including that of the carbon tax.’

Sasol itself avoids doing this and concludes that, rather than a carbon tax, government should intervene directly through the Integrated Resource Plan for electricity (IRP) and the Industrial Policy Action Plan (IPAP) and ‘by developing regional gas opportunities’. Sasol, of course, has a commanding interest in gas.

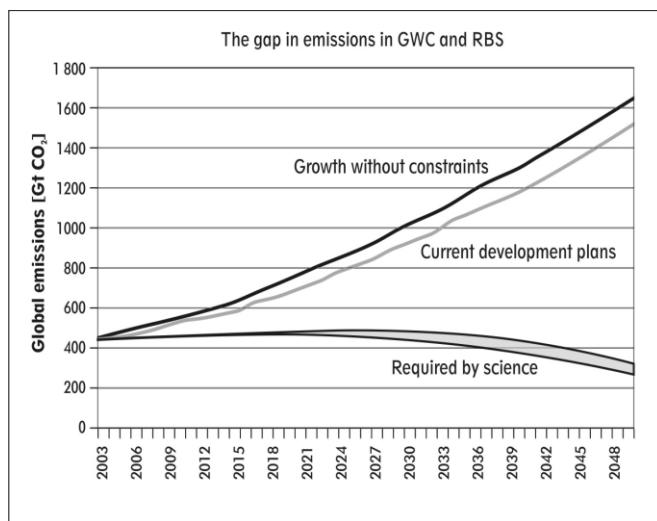
However, we believe that these positions were thoroughly canvassed between all corporate parties and the CAIA / BUSA position speaks for Sasol’s interests without the latter having to put its name to it. We thus think the objectives given in this Sasol note leave the underlying objective unspoken: to stall further action on mitigation.

The stated objectives are about comparing the emissions ‘outlook’ (i.e. Sasol’s projection of the path of future emissions) with government’s ‘peak, plateau and decline’ (PPD) trajectory and seeing if we are coming in ‘below target’. The PPD is specified in the national climate policy adopted in 2011 just ahead of the Durban climate negotiations.

## The PPD

The PPD has its origin in the offer South Africa took to the 2009 Copenhagen negotiations. This was subsequently formalised at Cancun in 2010. The Copenhagen offer was that greenhouse gas emissions should ‘deviate’ by 34% below business-as-usual by 2020 and by 42% by 2025. Emissions would then ‘plateau’ before finally declining after 2035.

This offer was said to be based on the Long Term Mitigation Scenarios (LTMS), a research document commissioned by the DEA in 2007. The LTMS constructed two scenarios: Growth without Constraints (GWC) which is used as the business-as-usual baseline for the Copenhagen offer; and Required by Science (RBS) which shows the emissions path necessary for South Africa’s contribution to avoid warming of more than 2°C. These two scenarios produce top and bottom lines for emissions through to 2050 with 2003 as the starting year as shown in the figure below.



Source: LTMS. Note: Vertical axis should read Mt CO<sub>2</sub>.

In 2011, DEA presented an unusually candid take on the numbers while preparing the national policy. It showed the business-as-usual baseline reaching 750 million tonnes of greenhouse gases in 2020 and 870 Mt in 2025. Hence, the Copenhagen offer translated to 495 million tonnes (Mt) in 2020 and 506 Mt in 2025. In 2011, emissions were already above these targets and, under intense pressure from business, the DEA cheated the numbers.

In March that year, it introduced an ‘error range’ into the business-as-usual baseline. This was an entirely arbitrary procedure with no technical justification. But it gave a semblance of mathematical objectivity and produced a very wide PPD range with upper and lower limits. The intention was obviously to allow for higher emissions but, for business, it did not allow enough. In August 2011, the error range was increased so widening the PPD range to allow an extra 110 Mt in 2025. The table below lays out the numbers.

**Table 1: South African emissions and promises in Mt CO<sub>2</sub>e**

	Actual		LTMS (GWC)			LTMS (RBS)		Copenhagen offer		Copenhagen 'revised' (Mar 2011)		Copenhagen 'revised' (Aug 2011)	
Dates	2004	2010	2011	2020	2025	2020	2025	2020	2025	2020	2025	2020	2025
CO <sub>2</sub> e Mt	440	518	545	750	870	460	453	495	505	418- 571	412- 599	398- 583	398- 614

As can be seen, the original Copenhagen offer was already substantially higher than what the LTMS said was required by science. The August 2011 revision is what went into national policy and the upper limit for 2025 is 160 Mt higher than RBS.

In our view, RBS itself was too high for several reasons: 1. It accepts the global target of a 2°C rise in temperatures. As climate scientist James Hansen argues, this is a recipe for disaster. We think the target should be to limit the rise in temperature below 1.5°C – the lowest rise that is now physically feasible. 2. The LTMS calculations are based on figures from the International Panel on Climate Change (IPCC). Wherever the IPCC gives a range, the LTMS takes the value at the easiest end of the range. 3. The LTMS rightly takes account of the principle of common but differentiated responsibility (CBDR) which allows for the fact that Northern countries are responsible for most of the emissions driving climate change. However, by bundling South Africa with the South in general, the LTMS gives it a free ride on the really low emissions from least developed countries.

The lower limit of the revised PPD may have been there for mathematical symmetry but it is now enshrined in the national policy. In 2014, the DEA initiated a process to define Desired Emissions Reduction Outcomes (DEROs). It said that annual emissions might fluctuate between the upper and lower PPD limits but the middle of the PPD range would be used to define the national budget. If this budget was exceeded in one five year period, it would have to be compensated for in the next. As can be seen in Table 2, the middle numbers are about the same as for the original Copenhagen offer. So this remains government's target.

Table 2: PPD to 2050, Mt CO<sub>2</sub>e

	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>	<b>2050</b>
Upper	547	562	583	614	614	614	552	490	428
Mid	473	480	491	506	506	506	444	382	320
Lower	398	398	398	398	398	398	336	274	212

Also in 2014, the DEA produced an updated GHG Inventory which gives 'observed' emissions for the period 2000 to 2010. It gives total emissions in 2010 as 544 Mt. This does not include the very substantial emissions from 'spontaneous combustion' – the open fires that burn on coal mines and dumps – or from fugitive methane emissions from abandoned mines.

At the same time, according to the Inventory, about 26 Mt GHG was removed from the atmosphere by land based ‘sinks’ – plants and soil that absorb CO<sub>2</sub> – so ‘net’ 2010 emissions came to 518 Mt.

When considering these figures, it should be noted that the DEA is heavily dependent on industry for the primary data. Industry apparently wants to keep it that way by opposing compulsory reporting of facility level emissions – which is the normal practice elsewhere. The draft GHG reporting regulations therefore only require corporate level reporting.

## **Sasol’s overview & assumptions**

It is striking that Sasol’s assumptions read rather like findings, suggesting that Sasol found what it set out to find. Hence, the overview, assumptions and conclusions repeat the same points with different detail.

As Sasol observes, 518 Mt is lower than the business-as-usual baseline projected by the LTMS for 2010. (The LTMS did not anticipate recession in 2008-09.) It also falls within the PPD range (398 – 547 Mt). This is not altogether surprising since that very wide range was created precisely to accommodate South Africa’s raging emissions. But it is well above the mid point (473 Mt) that the DEA says is the target.

Sasol also notes declining electricity production ‘since 2010’<sup>4</sup> and observes that ‘electricity accounts for nearly half of RSA’s GHG emissions ...’. According to the Department of Energy’s (DoE) IRP Update (Nov 2013), power emissions are about 45%. This is something short of ‘nearly half’. Besides, other things being equal, the share of emissions from other sources would automatically increase as Eskom’s production declined.

In the overview and assumptions, Sasol focuses almost exclusively on Eskom. Only one point (VI) addresses the wider economy which Sasol assumes cannot grow in emissions ‘without the availability of electricity’. This is the only assumption behind the projection that ‘non-electricity sectors grow at 50% of the MPA study’. The conclusion, however, also notes slower economic growth and increased energy efficiency – both of which are attributed to reduced electricity production and increased pricing.

Slow economic growth is not, of course, solely down to Eskom. The global economy has not recovered from the (misnamed) ‘great recession’. We agree that this may have slowed the rate of increase in GHG emissions. But with this caveat: at plant level reduced production is frequently accompanied by increased emissions intensity – as is the case for Sasol itself.

The increase in electricity prices is also likely to have driven greater efficiency. Big industry has a long history of wasting what was the cheapest electricity in the world so there is

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<sup>4</sup> Sasol quotes a Stats SA publication dated May 2015 and embargoed to 2nd July. It would not have been publicly available when Sasol prepared this slide ahead of the DTC presentation on 12th May.

considerable potential for saving. One might add, of course, that raising the price of emitting carbon is precisely the aim of the carbon tax. We should note that we are sceptical of Treasury's arguments for 'getting prices right' and then leaving it to the market. However, the impact of electricity prices on efficiency might be taken as a demonstration of the efficacy of pricing.

As to Eskom, reduced production has not resulted in reduced emissions. In the year to March 2012, it produced 237 terawatt hours (TWh) and pumped out 232 million tonnes of carbon dioxide. In 2014, total production was down to 231 TWh but emissions were over 233 Mt. This may be because of the declining efficiency of its coal plants and because it was over using the diesel plants that are supposed to kick in only at peak demand times.

Loadshedding, meanwhile, has driven many firms, from mines to supermarkets, to bring in their own diesel generators. The meltdown at Eskom is thus as likely to increase as to reduce energy emissions. (There is nothing in Sasol's note to indicate that it accounts for this new source of emissions.)

Sasol then projects that electricity emissions 'will remain flat until 2021 when Medupi and Kusile are fully online'. This is risible. The first unit of Medupi is coming online now and the rest are scheduled to follow at 6 month intervals. The first unit of Kusile is meant to start up in 2017. They will be late, no doubt, but unless equivalent units are shut down as they come online, another 60 Mt of emissions will be added during this period, not at the end of it.

The relevant Sasol assumption (VIII) reads: 'Even with the start-up of units from Medupi earlier than 2021, the average electricity growth rate is expected to remain relatively muted unless the current Eskom fleet availability improves.'

First, we note again that the electricity growth rate is not necessarily linked one-to-one with the carbon growth rate. Production from the central coal basin is in decline and Eskom says that the quality of coal is likewise declining. Eskom also has to truck more and more coal by road or rail as some of the mines tied to particular power stations are closed. This suggests rising carbon intensity.

Second, Medupi's new units will add to current emissions at 'current fleet availability'. For this assumption to hold, it should read that there will be a further loss of plant availability. Or, as we put it above, that equivalent units are shut down as the new units come online.

We advocate that they are shut down, starting with the most polluting plants with remote coal supplies or which are driving the development of new mines in sensitive areas – such as the critical watershed of the Mpumalanga lake district. We are likewise opposed to Sasol's own coal mine expansion. We would welcome reduced electricity production from coal starting now and an instruction to Eskom that it focus on renewables.

But this is not what Eskom or government is planning. First, Eskom plans to improve plant availability. Second, the draft IRP Update shows units at the oldest plants closing from 2020 and the draft Integrated Energy Plan shows the first units closing only in 2022. IRP Update shows emissions increasing well above the PPD range before being sharply (and improbably) reduced to the upper limit in 2025.

Sasol's assumptions say nothing about the renewable energy programme, announced in 2012 and already making a substantial contribution to the grid at a lower cost than new coal power.<sup>5</sup> In government planning, however, renewables do not replace coal but are additional to the expansion of coal-fired power. It will reduce the carbon intensity of power but overall emissions will continue to rise.

Moreover, the renewables programme is now being made the model for the procurement of privatised coal-fired power – the so-called base-load independent power producer (BLIPP) programme. Government initiated this process this year (2015) but Sasol does not mention it. It is very unlikely that any coal project will be brought on line as quickly as wind or solar so it may be that these plants will not contribute to additional emissions until after 2021.

## After 2022

Sasol concludes that 'GHG emissions are expected to remain below the PPD for the next few years'. As noted above, the big industry associations are all repeating the message that emissions are already 'below government's target'. This treats the PPD upper limit as the target. 2010 emissions of 518 Mt were substantially above the middle of the PPD range (473 Mt) which is Government's actual target. This in turn is well above what is needed. Whereas industry chooses to notice only the top limit, we must note that the bottom limit is still too high for a fair contribution to preventing devastating climate change.

After 2022, however, Sasol's slide 14 shows emissions rising sharply – as if in triumph – to break through the upper limit. The relevant assumption (IX) says: 'Thereafter GHG emissions growth after 2022 is as per the BAU rates laid out by the DEA's previous projections in the 2011 report indicated above.'

This reads more like a finding than an assumption but seems to conceal a real assumption: that South Africa's high carbon economy is constrained by the electricity crisis and will recover once full power is restored. Hence, 'below target' emissions do not indicate economic transformation. The minerals-energy complex (MEC) remains large and in charge and a low carbon economy is not in prospect and not wanted.

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<sup>5</sup> Tobias Bischof-Niemz, *Financial benefits of renewables in South Africa in 2014*, CSIR Energy Centre, 21 January 2015.

## Sasol's Data table

Sasol says that the data table is ‘referenced to Slide 14 of its DTC presentation’ – i.e. these are the numbers represented in the chart. It gives figures through to 2050 under five headings.

The first column heading – ‘GHG Inventory’ – is wrong. The Inventory reports ‘observed’ emissions up to 2010 and does not project future emissions. The numbers are actually the LTMS GWC projection given in the DEA’s August 2011 revision of the Copenhagen offer. This is the top line in the chart.

Next is the PPD upper limit (UL). This is the blue line in the chart. There is no reference to the lower limit or the mid point.

The third column is headed, ‘No electricity & industrial growth until 2022’. It shows emissions at steady at 518 Mt from 2008 to 2021. In fact, the GHG Inventory gives the 2008 and 2009 emissions as 493 and 496 Mt respectively. 518 Mt for 2010 is correct. The rest, from 2011 to 2050, is projection and appears to follow simply from the heading: no growth = no change in emissions. From 2022, emissions appear to rise at about 3-3.5% annually. This column is not represented in the chart.

The fourth column – ‘No electricity growth to 2022’ – appears to be Sasol’s ‘emissions outlook’, the dark shaded area in the chart. It shows emissions rising at about 1% a year from 2010 to 2021. The text boxes in the chart indicate that it imposes a flat line (no increase) on emissions from power generation but allows emissions from the non-electricity sectors to grow at 50% of the rate given in the Mitigation Potential Analysis study. After 2021, emissions rise at about 3-3.5% annually.

The last column is headed ‘implementation of the moderate decline case’ (from the IRP Update). In IRP Update, the ‘moderate decline’ scenario indicates emissions rising to 663 Mt<sup>6</sup> in 2021 and 691 in 2024. Emissions are then arbitrarily reduced to 614 in 2025 (the PPD upper limit) and plateau at that number until 2037. They then decline to 447 Mt in 2050. Sasol’s version shows emissions at 518 Mt (no increase) in each year to 2021. Emissions then rise to catch up with, and overtake, the IRP numbers in 2035. It shows an even more moderate decline to 575 Mt in 2050. Sasol does not say how it gets to this result. This column is not represented in the chart.

Our overall impression is that this is a rather slight and somewhat sloppy piece of work. As noted earlier, the results are more or less dictated by the assumptions.

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<sup>6</sup> IRP Update gives emissions from power generation only but assumes that this is 45% of national emissions. It shows 2021 power emissions of 298.5 Mt [Table 33] which is 45% of 663 Mt.