

## **SASOL'S PROGRESS REPORT SUBMISSION ON THE POLLUTION PREVENTION PLAN**

### ***COMPANY NAME:***

Sasol South Africa (Pty) Limited (which includes our CTL/GTL and Chemical operations) and Sasol Mining (Pty) Limited

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### ***OVERVIEW OF THE MATERIAL CHANGES IN PROJECT DELIVERY:***

Since submission in 2017, there have been changes in anticipated project delivery, some performing more positively and others not performing as well. Specifically, production outputs in the area of energy efficiency have not performed as well in 2018. The projection for reduction in emissions from energy efficiency was thought to increase from 2017 to 2018, however this target was not reached due to recurring process instabilities (related in part to frequent power outages) and the commissioning of a new unit that consumed more energy. It is anticipated that the project savings will improve off the 2018 value, as plans have been put in place to address the issue.

In terms of the propylene project, the duration of the shutdowns were longer than anticipated and resulted in unforeseen flaring of propylene. Value chain upsets resulted in flaring of propylene and the drive to move towards a 100% ULP95 capability drastically reduced the ability to sink excess propylene, which impacted flaring from 2015 onwards.

## 1. TOTAL ANNUAL EMISSIONS FROM EACH ACTIVITY MEASURED AS CO<sub>2e</sub> FOR THE PRECEDING CALENDAR YEAR

Production Process	GHGs	2016*	2017*	2018*	2019	2020	Preceding year (2015)*	Total GHGs (2016-2020)	Methodology
<b>Production of liquid fuels and chemicals from coal or gas: fuel combustion</b>	CO <sub>2</sub>	29 356 583	28 458 796	26 570 183			30 412 241	<b>84 385 562</b>	Sasol applies a mass balance approach to calculating its emissions associated with our fuel combustion and energy operations. A Tier 3 approach is applied. Calculations are based on the results of measurement devices which have inherent measurement uncertainty. Regular calibrations and verifications occur to reduce the uncertainty and quality checks and balances are built into the mass balances to ensure as accurate as possible calculations.
	CH <sub>4</sub>	-	-	-			-	-	
	N <sub>2</sub> O	-	-	-			-	-	
<b>Production of liquid fuels and chemicals from coal or gas: fugitive emissions</b>	CO <sub>2</sub>	24 690 944	25 578 843	24 541 983			24 487 755	<b>74 811 770</b>	Sasol reports emissions associated with gas production and clean-up under the Energy Sector. These process emissions are calculated utilising a stoichiometric / mass balance approach, representing a Tier 3 approach.
	CH <sub>4</sub>	96 164	96 416	90 242			95 915	<b>282 822</b>	
<b>Ammonia Production</b>	CO <sub>2</sub>	242 079	241 415	299 402			272 963	<b>782 896</b>	The emissions associated with ammonia production are determined by means of continuous online monitoring with a subsequent flow and mass balance calculating the CO <sub>2e</sub> released via the Benfield unit and hence falls into the category of Tier 3.
	CH <sub>4</sub>	5 952	7 962	5 743			7 973	<b>19 658</b>	
<b>Nitric Acid Production</b>	N <sub>2</sub> O	489	692	1845			439	<b>3 026</b>	Nitric acid production emissions have been determined through the development of emission factors based on stack emissions and production rates. Sasol's emissions are reported on a Tier 3 approach through continuous measurement.
<b>Coal Mining</b>	CO <sub>2</sub>	16 170	19 410	16 202			19 804	<b>51 782</b>	Fugitive emissions are calculated according to the Tier 2 methodology which is based on country specific emission factors. The factors represent the average values for the coal being mined by Sasol.
	CH <sub>4</sub>	3 304	3 229	3 992			6 658	<b>10 525</b>	
<b>Waste</b>	CO <sub>2</sub>	209 568	188 027	178 627			300 277	<b>576 222</b>	Sasol applies a mass balance and chemical oxygen demand methodology making a Tier 3.
	CH <sub>4</sub>	3 864	3 853	3 853			3 853	<b>11 571</b>	
<b>Total CO<sub>2e</sub></b>		<b>57 173 520</b>	<b>57 254 808</b>	<b>54 540 696</b>			<b>58 254 168</b>	<b>168 969 024</b>	

\*This data is based on best available information as at March 2019. Through on-going data optimisation processes, the level of residual uncertainty, over time, has reduced and is likely to continue to reduce.

## 2. ANNUAL REPORTING ON MITIGATION INTERVENTIONS FOR YEARS 1 TO 5

Mitigation measures	Brief description	Affected GHG	Anticipated emission reduction (ktCO <sub>2</sub> e)					Actual emission reduction achieved (ktCO <sub>2</sub> e)						Assumptions	Implementation date
			2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	Total (actual)		
Sasolburg Gas Engine Power Plant - Heat Integration Project	Heat integration utilising waste heat from engines.	Direct CO <sub>2</sub>	82	98	55	55	55	82	98	65.9			246	65.6 ton/h steam at a pressure of 26.5 bar.	Installed in 2015
Propylene Expansion	Upgrading capacity to utilise additional propylene from Secunda.	Direct CO <sub>2</sub>	9	19	19	19	19	17.4	4.5	0.05			22	Based on 6000t/a flaring reduction.	Installed in 2016
Fuel use management	Installed a system to better manage fuel consumption at Sasol Mining.	Direct CO <sub>2</sub>	1	1	1	1	1	1	1	1			3	Reduced use of diesel for transportation.	Installed in 2015
Energy improvement roadmap	Aims to deliver sustained improvements in energy efficiency. The impact of initiatives is measured against a baseline.	Indirect CO <sub>2</sub>	270	510	610	610	610	270	510	131			911	Estimated based on targeted steam and electricity savings.	Progressive increase toward December 2020 target completion date
Vinyl Chloride Monomer energy saving project	Installation of variable speed drives and energy efficiency improvements to fans, pumps and blowers.	Indirect CO <sub>2</sub>	2.1	2.1	2.1	2.1	2.1	2.1	2.1	0.91			5	Electricity savings.	Installed in 2015
Fan replacement	Replacement of 37 kW Force fans with 22 kW Force fans throughout Sasol Mining.	Indirect CO <sub>2</sub>	11	23	23	23	23	15	30	30			75	Electricity savings: Each production section uses 7 x 22kW fans. The number of fans in use is currently based on the allocation of production sections per mine. The energy saving is then calculated at: 29433600kWhr (15kW x 32 sections x 7 fans per section x 24hrs x 365 days). It is assumed that the number of production sections at these mines will remain the same for the next 5 years.	Installed in 2015
<b>Total ktCO<sub>2</sub>e</b>			<b>375</b>	<b>653</b>	<b>710</b>	<b>710</b>	<b>710</b>	<b>388</b>	<b>646</b>	<b>229</b>			<b>1262</b>		

### 3. DEVIATIONS FROM THE PLAN

Mitigation measure implemented	Deviations from approved PPPs (if any) and remedial action undertaken	Risk & Limitations (if any)
Sasolburg Gas Engine Power Plant - Heat Integration Project	Reductions are better than anticipated, and lower than historic trends mainly due to lower production volumes.	-
Propylene Expansion	The duration of the shutdowns were longer than anticipated and resulted in unforeseen flaring of propylene. Value chain upsets resulted in flaring of propylene and the drive to move towards a 100% ULP95 capability drastically reduced the ability to sink excess propylene which had a large impact on flaring from 2015 onwards.	Downstream upsets conditions influence the flaring at Polymers.
Energy improvement roadmap	Process interruptions dominated the production landscape in 2018 and energy, in support of production, followed suit. Therefore the target for 2018 was not reached due to these recurring process instabilities. The main causes being multiple external interruptions <b>in the Eskom power supply to the plant</b> as well as the commissioning of a new unit which had a negative impact on the overall energy intensity. Plans are in place for Y4 and Y5 to address this.	-
Vinyl Chloride Monomer energy saving project	Lower than anticipated reduction, due to lower production volumes and not utilising the full energy savings technology to its maximum capabilities. Although reductions are expected to increase towards 2020, the increases are plant stability and market dependent.	-
Fan replacement	Reductions are better than expected. This project started in 2015 with the delivery of 136 fans by the end of 2015. The power saving potential is based on the heading ventilation benefit of 15kW per operating fan.	The actual savings realised from ventilating with the 22kW fans was better than the projections because at the time of introducing the newly designed fans, it was not yet certain if they would consistently perform to expectations. These fans however delivered to expectations and were kept in service as a permanent ventilation solution for the methane content and release rate in the current coal reserves being mined.