Response to questions for Sasol from the NECA forum

For ease of reference the questions from the NECA forum are quoted in blue (with numbering as per letter dated 23 January 2024) and Sasol's responses in black.

2.1. Achieving the 30% SOx reductions:

2.1.1. Will the load reduction of 30% by 2030 come solely from boiler turn down, or does it rely on additional interventions?

The load reduction of SO_2 will solely come from boiler turndown *(see section 2.11 of Sasol's appeal, read with Annexure"B" - Final Motivation Report for Sasol South Africa Limited operating through its Secunda Operations thereto – 1.1, 4.1, 7 and read with Annexure "N: - Feedback to the NAQO in the 12A application – page 7 – 8, page 21- 23)*. In essence, steam production from the boilers will be reduced by an equivalent percentage to enable the 30% emission reduction. The current facility cannot effectively operate with such a significant reduction in steam from the boilers and therefore a number of enabling projects are underway to enable continued, effective operation of the Secunda Operations at these reduced steam loads. Current forecasts indicate that these projects will take more than five years to implement at a cost of approximately R20 billion *(see section 2.7 of Sasol's appeal)*.

The steam plants with its 17 boilers are heavily integrated in the Secunda facility *(see section 2.5.1 of the appeal, read with section 2.1.1 and 2.1.2 of Annexure "B" to Sasol's appeal).* The steam produced by the boilers are, in the first place, used as feedstock to our coal-to-liquid process. In addition to this the steam is also used as a utility for heating and motive purposes. The remainder of the steam is used to generate a portion of the electricity for the facility, without which more will have to be imported from Eskom *(refer to section 2.5.2 of Sasol's appeal). This is anticipated to follow upon Eskom's completion of an upgrade of the substation serving the Secunda facility.*

The coal-fired boilers produce steam from fine coal, a by-product of mining coarse coal for gasification. If the boilers are turned down, alternative steam and electricity solutions and alternative uses of fine coal need are necessary *(see section 2.5.2 and 2.5.3 of Sasol's appeal, read with Annexure "N" thereto – page 15)*. These enabling projects are complex with associated significant technical scope and will take time to safely implement at our operating plant. The importation of renewable energy, as one of the enabling solutions for reduced electricity generation, is linked to a project that is being implemented by Eskom (project Mulalo). Consequently, the implementation of the full integrated emission reduction solution will only be realised by 2030 (*see section 2.7.1 of Sasol's appeal)*.

2.1.2. Please could you describe how the procurement of gas assists with the reduction of SOx, if this is the case?

The procurement of gas <u>will not</u> assist with, nor is it a prerequisite for the reduction of SO_2 emissions from the boilers in question. The gas, referred to above, is intended to make up production volumes due to reduction of coal to gasification (and not as GHG reduction lever per se).

The procurement of an additional 40 – 60 Peta Joules (PJ) of natural gas and installation of additional gas reforming capacity is an option that Sasol is considering as part of our greenhouse gas (GHG) reduction roadmap enabling Sasol's GHG 30% GHG reduction target as voluntarily committed *(see section 2.3 and 2.14 of Sasol's appeal read with annexure "N" thereto – page 26 – 29).* The gas, referred to above, is intended to make up production volumes due to reduction of coal to gasification (and not as GHG reduction lever per se). During roadmap optimisation however, the implementation of gas reforming capacity is currently not deemed economically viable, and the project has been placed on hold during 2023. The achievement of the 30% GHG reduction target is, however, still achievable. In this regard, projects to extend the gas plateau and secure additional gas volumes from our own reserves continue (US$1Bn spent over period of three years) and are being pursued but these are unlikely to be able to provide the additional 40 - 60 PJ referred to above and intended to claw back production volumes and not for SO_2 reduction.

2.1.3. Please can Sasol identify the reduction pathway to 2030 (i.e. the level of SOx reduction in each year leading to 2030)

As already mentioned above, because of the complexities, the magnitude of the scope and the implementation timeframes associated with the enabling projects, a phased and carefully executed plan is critical for the safe and efficient implementation of the full integrated emission reduction solution. Due to this a year-on-year reduction of SO_2 after the first boiler is turned down in 2025 is not reasonably anticipated. This is because the turning down of further boilers, before we have fully implemented the renewable energy, energy efficiency, fine coal solution and electricity import project (Project Mulalo) is not only technically infeasible but will place additional strain on the national grid at a time when South Africa is facing an energy crisis.

The implementation of the portion of the integrated solution underpinning the next reduction will only be achieved in 2030 when the abovementioned projects have been completed and the additional boilers are turned down *(refer to section 2.7 of Sasol's appeal read with Annexure "B" to the appeal – section 4.2).*

	1 April 2025	1 April 2030 onwards
SO_2 reduction	4% reduction (503 t/d)	30% reduction (365 t/d)

2.1.4. What projects/ milestones are on the critical path for achieving the 30% reduction (e.g. Morapule), and what are key risks to achieving each?

We are unsure what "Morapule" refers to in the question but have, for purposes of this response, assumed this is related to the electricity import project, Mulalo, referred to in our application and appeal. This project involves an upgrade to Eskom infrastructure and is funded by Sasol, but executed by Eskom.

As referred to above and detailed in Sasol's application and appeal, the enabling projects include the import of renewable energy and continued implementation of energy efficiency for optimised steam usage for the facility. Given the reduction of fine coal usage in the boilers due to boiler turndown, the implementation of a solution to manage excess fine coal is also applicable *(refer to section 2.5 of Sasol's appeal)*.

The status of these projects and associated risks are explained in Sasol's recent 2023 Climate Change Report accessible on https://www.paperturn-view.com/sasol-pty-ltd/sasol-climate-change-report-2023?pid=MzU353005.

For ease of reference we restate the information below:

1) Electricity solutions – Renewable energy (RE)

Our aim is to procure up to ~1 200MW of renewable energy (RE) by 2030 (in partnership with Air Liquide, of which 800 MW is for Sasol).

For the first tranche of RE, we have signed a number of power purchase agreements (PPAs) to procure a mix of wind and solar PV energy from various project developers. It is expected that these renewable energy projects will be operational from end-2025 onwards. In total, these PPAs represent more than 600MW procured for the Secunda site. However, this is subject to the requisite regulatory and financing approvals to be obtained.

2) Implementation of a fine coal solution

Several excess fine coal solutions have been evaluated for technical feasibility to enable the business to utilise fine coal as a feedstock for Secunda's gasification process. Technical feasibility studies were undertaken focusing on understanding the ability to address the full extent of the excess fine coal challenge, cost implications and execution schedules. Accordingly, fine coal briquetting, a process in which fine coal is moulded into briquettes for effective consumption in the gasifiers and therefore addressing the fine coal excess when turning down boilers and optimising feedstock usage, was selected as the preferred solution.

A key risk in this regard is project schedule delays. To mitigate these, smaller-scale solutions will be pursued for the period between turndown of the first boiler (targeted for 1 April 2025) and availability of the large scale briquetting solution to enable the turndown of more boilers. We remain on track to deliver key milestones for the approval of basic engineering development for this solution.

3) Steam solutions (energy efficiency)

We are developing a suite of options to make and save steam in our plants. The major focus is on energy efficiency with additional steam production solutions being key considerations in the development of our roadmap. Novel options are being tested by our Research and Technology (R&T) function and options such as biomass boilers or process electrification using renewable energy, as low carbon steam solutions, are being investigated.

The complementary option of low-carbon steam generation is a key enabler to transition our feedstock mix and produce higher-value green products in the long term. Heat integration is also being explored. Although heat integration is a known technology, we have not yet been able to implement this solution in our Synthol plants because of technical integration challenges. We aim to implement a demonstration unit before we roll out at full scale. Sasol is

planning to pilot this technology and is close to concluding the basic engineering design for the heat integration demonstration project at Secunda.

For each of these key risks Sasol has a detailed mitigation plan and remains on track to deliver key milestones for each project. This is key to Sasol's licence to operate and meeting its GHG reduction commitments.

2.1.5. Please can you describe progress with fine coal solution.

Please refer to the response in 2.1.4 (2) above.

2.2. Community offset projects:

2.2.1. What are the proposed community offset projects that are referred to?

As part of our commitment to the duty of care, to account for the interim period from 2025 to 2030 when the integrated emission reduction is implemented at full scale, Sasol indicated *(refer to Section 4.24 of Sasol's appeal)* that we are proposing to implement offset projects in consultation with relevant stakeholders. These are envisioned to include the implementation of local renewable energy projects to improve energy security and/or enhanced air quality monitoring.

2.2.2. Please describe progress with these projects.

Although the above remains a proposal for implementation to supplement the implementation of the integrated solution as explained above, Sasol has already demonstrated significant progress on its existing air quality offsetting programs in Secunda and Sasolburg. In Secunda phase one of our offsetting programme focused on the reduction of particulate matter (PM) and SO_2 pollution in the surrounding (fenceline) communities and included specific activities such as:

- The insulation of 5 532 Reconstruction and Development Programme (RDP) houses and replacing coal stoves with liquified petroleum gas stoves and heaters;
- An environmental air quality education and awareness programme conducted with 7 700 households and 26 000 learners through door-to-door and primary school campaigns;
- Cutting of grass and preparation of fire breaks for veld fire management; and
- Informing communities through education and awareness of best practices on separation, sorting and recycling of waste as opposed to burning with recyclable waste collected and taken to a buy back centre by households.

This air quality offsetting project was the largest investment project of this nature and was groundbreaking as it addressed an existing challenge of domestic solid fuel burning. In addition, job opportunities were created, and Small and Medium-size Enterprises (SMEs) were empowered through the offsetting implementation programme *(refer to Sasol's 2021 and 2022 sustainability report under air quality management on https://www.sasol.com/investor-centre/sustainability-reporting)*.

2.2.3. What evidence can you provide of successful implementation?

A third-party appointed by Sasol conducted a study to quantify the benefits to the ambient air quality and to communities of the abovementioned offsetting initiatives. These emission calculations, submitted to the NAQO, determined the following:

- Approximately 123 tons of PM10, 115 tons of PM2,5 and 69,5 tons of SO_2 were avoided as a result of the offsetting projects over the duration of the implementation (2017 to 2020) with these pollutants continuing to be avoided to date.

- Approximately 11 500 tons of waste was removed between 2018 and 2021, avoiding the equivalent emissions of around 85 tons PM10, 79 tons PM2,5 and 11 tons SO_2.

Additionally, an independent evaluation conducted by NOVA, on the success of this household implementation intervention, was presented at the annual conference of the National Association of Clean Air held in 2023[1].

2.3. Investment in SOx reductions 2.3.1. It is stated in Sasol's appeal (7.8) that the addition of a gas fired boiler reduced 13000t of SOx from the airshed. Please confirm that these reductions were not from the Secunda site, rather due to offsetting the use of Eskom electricity?

It is important to highlight that, with reference to Section 7.8 in the appeal we refer to the installation of gas-fired turbines and not gas-fired boilers. Secondly, the reductions as stated above was to reduce the reliance on imported electricity from Eskom, which is imperative to our energy efficiency program, thus the reduction of SO_2 is from the airshed and not directly from the Secunda site.

2.4. Ad para 2.4.4 of Sasol's appeal:
It is stated that, "*the Appellant undertook technical studies totally R246 million and dedicated over 200 resources to investigate a viable solution to meeting the concentration-based limit."*

2.4.1. In addition to these technical studies, were projects implemented to reduce Secunda's SOx emissions? If so, what are they, how much did they cost and what SOx emission reduction did they achieve?

It is important that the response below is read in the context of Sasol's appeal with specific reference to the details provided in Annexure "N" and Annexure "1" thereto.

The short response is yes. In addition to the above technical studies mentioned, Sasol has spent in the order of R11 billion on different elements of energy efficiency improvement which has resulted in a reduction in SO_2 emissions from 2016 at the steam plants within the facility *(refer to 7.6 and 7.7 of Sasol's appeal read with Annexure 1 to Annexure "N" to the appeal)*. Energy efficiency improvement is aimed in Sasol's context to reduce the energy requirement for products produced from the facility. Over time this energy efficiency drive has resulted in a reduction in steam demand from the coal fired boilers and hence lower SO_2 emissions as

[1] Evaluation of a Household Intervention Implementation in the Sasol Secunda Air Quality Offset Programme

indicated in Figure 6 of Sasol's appeal *(under section 7.6)* which highlights the facilities steam plants absolute SO_2 emissions and SO_2 intensity per product. It is noted that 2019 – 2022 data used to inform this graph is from our 2022 sustainability report.

The reductions in SO_2 emissions can be clearly seen from 2016, with the exception of 2020 (considered an outlier due to COVID-19) and is aligned with improved energy efficiency reporting for the Secunda facility.

We refer you to Annexure "V" to Sasol's appeal for more details on the energy efficiency projects which have resulted in SO_2 reductions at the steam plants within the facility.

2.4.2. What is meant by "200 resources"?

The above reference was made in the context of explaining the technical assessments conducted by Sasol since at least 2006 towards enabling compliance with the emission standard in question. In this regard, refer to, Annexure "N" to Sasol's appeal specifically from page 32 onwards. The numerous technical studies/assessments conducted included abatement technology investigations and involved, apart from Sasol employees, global and local independent service providers and experts. The resources referred to include the cumulative number of human resources dedicated to the above ranging from scientists, chemists, multi-disciplinary engineers, project managers, engineering managers and cost controllers.