

Parliamentary Portfolio Committee on Environment, Forestry and Fisheries

Sasol briefing on air quality compliance roadmaps & greenhouse gas reduction strategy





Picture: Sasol Secunda Operations

- Opening remarks and summary
Marcel Mitchelson
- Progress on Sasol's air quality compliance roadmaps
Wilma Groenewald
- Sasol's greenhouse gas reduction strategy
Shamini Harrington
- Closing remarks
Marcel Mitchelson
- Q&A



Parliamentary Portfolio Committee on Environment, Forestry and Fisheries

Introduction and opening remarks

**POSITIONING FOR A
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Summary - air quality compliance and GHG emission reduction progress and plans



- Sasol is compliant with its obligations - since 2014 we have **progressed our compliance journey from 80% of our emission sources being compliant** with the Minimum Emissions Standards (MES) to **98% of our emission sources currently being compliant**, with the residual point sources being addressed **through air quality compliance roadmaps in accordance with postponements granted**
- In respect of the **residual compliance milestones** for which postponements until 2025 have been granted:
 - Sasol is **on track to meet particulate matter (PM), nitrous oxide (NOx) and volatile organic compound (VOC) MES standards** by 1 April 2025 at both our Sasolburg and Secunda plants and at our Joint Venture Natref operations
 - **Sasol is on track to meet sulphur dioxide (SO₂) MES standards at our Sasolburg and Natref operations** by 1 April 2025
 - **There is one remaining air quality challenge namely boiler SO₂ compliance at our Secunda steam plant operations** - we will not be able to timeously comply by 1 April 2025. We are progressing our ongoing compliance efforts, amongst others through developing coal beneficiation as an abatement option whilst also assessing **alternative pathways linked to our GHG emission reduction program i.e. an integrated air quality and GHG solution**
- In addition to our on-site investments, **we have invested significantly in air quality offset programmes (R400m spent to date)** resulting in **the avoidance of emissions of more than 207 tons of PM10, 194 tons of PM2.5 and 80 tons of SO₂ in the surrounding community/airshed**
- **Sasol is on track to deliver on a higher ambition 2030 GHG emissions reduction target and a 2050 reduction ambition** for our South African Energy Operations. We will be announcing these plans at our Capital Markets Day taking place in September 2021. Our targets are supported by roadmaps detailing the interventions including **renewable energy and hydrogen**
- In support of a **Just Energy Transition, we are driving the development of the green hydrogen economy to decarbonise and replace coal** as feedstock over time. We aim to commercialise sustainable aviation fuels and chemicals using our **feedstock agnostic Fisher-Tropsch technology, green hydrogen and sustainable carbon sources**. We are working with a range of stakeholders on **catalytic projects to stimulate the potential of the green hydrogen economy in South Africa**



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Progress on Sasol's air quality compliance roadmaps

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Sasol's air quality compliance approach



- Sasol's operations complied largely in 2014 already with the MES and only some point sources were identified for which postponements were required to implement abatement through air quality compliance roadmaps along extended timeframes
- The reasons for the postponements were mainly driven by:
 - **unavailability of identified technology at the time** to retrofit abatement to achieve compliance, in particular for existing plants to meet the same standards as for newly commissioned plants
 - implementation schedules being impacted due to the necessity to allow **time for statutory maintenance** (shutdown and general overhaul) to be conducted; and
 - enabling effective management of **implementation challenges in brownfields operations** to avoid disruptions in production of the fuels and chemicals relied on by South Africa
- Sasol's **postponement applications were well motivated and substantiated by Atmospheric Impact Reports (AIRs)**, subjected to **public participation**² and supported by **air quality compliance roadmaps** explaining our actions and commitments towards compliance
 - The AIRs were **independently peer reviewed** and informed the alternative emission limits to apply and be complied with in the interim
 - Our roadmaps considered **alternative feedstocks, optimised processes, improved efficiency and focused abatement technology retrofits**
- The postponements were granted and included as requirements and conditions of Sasol's atmospheric emission licences (AELs) under which we operate
 - Requirements for the implementation of **offset programmes were also included as AEL conditions**

Overview of improvement and compliance achievements at our Sasol and Natref Operations



Our Secunda, Sasolburg and Natref operations invested in several projects and initiatives to advance our commitments

Particulate matter (PM) emission reduction

- Piloted 3 different technologies at commercial scale at Secunda operations' boilers
- Installed to date **high frequency transformers at 7 of our boilers' electrostatic precipitators** at Secunda and **upgraded the electrostatic precipitators of 7 of the 12 operational boilers at Sasolburg**
- Replaced Natref catalytic cracker and regenerator cyclones in 2016 to lower PM emissions. Also, the fuel oil firing phase-out at Natref in December 2019, reduced PM and SO₂

High frequency controllers



Nitrogen oxide (NOx) emission reduction

- Installed **low NOx burners** on 2 boilers at Secunda and 4 of the 12 operational boilers at Sasolburg
- Installed new heaters at Natref with **low NOx burners**

Sulphur dioxide (SO₂) emission reduction

- **Natref installed an analyser** at the sulphur recovery unit to ensure optimal sulphur recovery and **re-routed one of the largest SO₂ emission sources** at Natref
- Natref steadily reduced SO₂ emissions by **switching to lower sulfur crudes**



RTO

Volatile organic compounds (VOC) emission reduction

- Installed a **vapour recovery unit** for loading station in 2016 at Secunda
- Installed **seven regenerative thermal oxidisers (RTOs)** and piped **114 emission sources** in 2017 and an additional 7 main sources in 2020 at Secunda
- Secunda undertook an emission baseline for **345 tanks confirming 342** are complying with the MES
- Natref installed **VOC abatement technology in 2019**

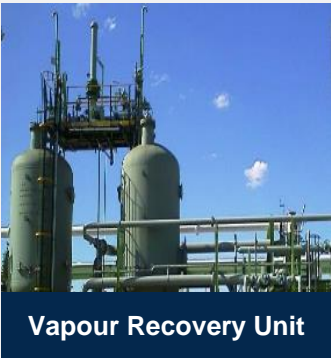
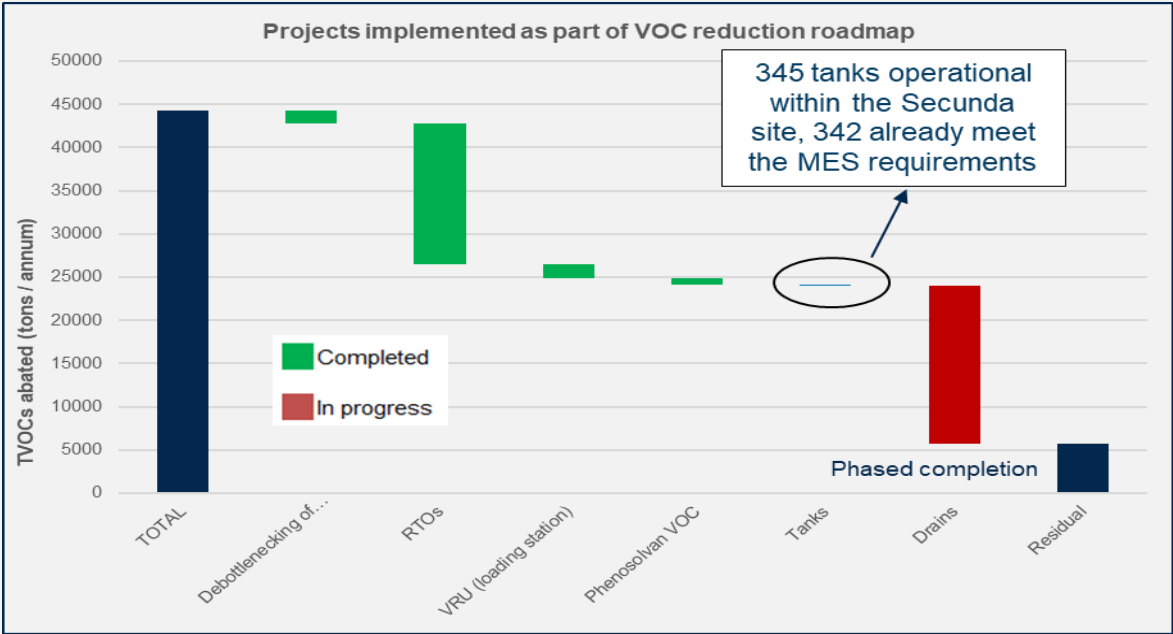
Incineration

- Shut down 3 incinerators through alternative waste handling technology at Sasolburg and one incinerator at Secunda

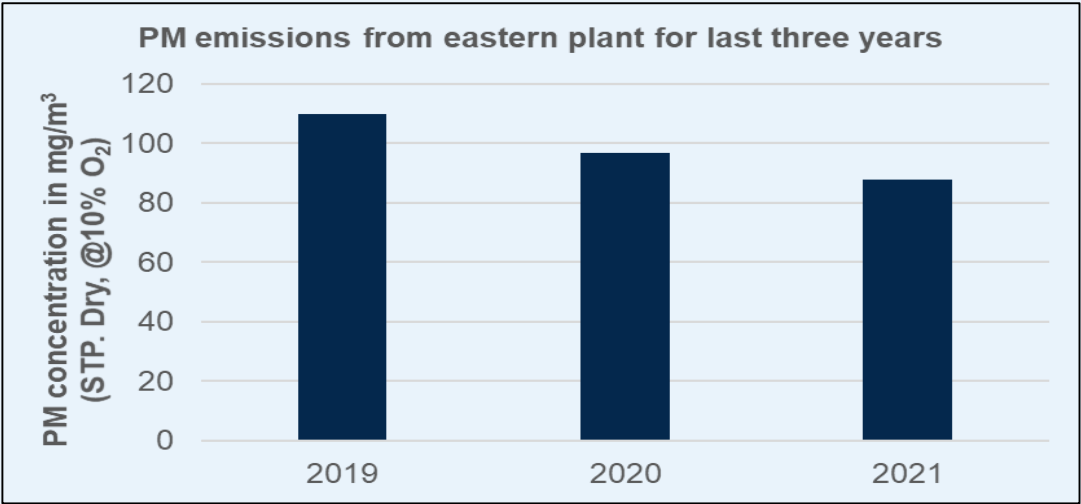
Examples of compliance achievements at our Secunda operations



Various projects were implemented to reduce total volatile organic compound emissions



Increased focus on maintenance, operational improvements and abatement technology installed already contributed to a $\pm 15\%$ reduction in PM emissions in 3 years



- Three electrostatic precipitator controller technologies were piloted and evaluated
 - Medium frequency controller
 - **High frequency controller**
 - High voltage pulse energisation controllers
- **Seven** high frequency controllers installed and the remainder will follow before April 2025

We completed phase one of our offset programs and remain committed to further deliver on our on-going offsets programs



- The first phase of the offset project focused on the reduction of PM and SO₂ pollution in fence line communities
 - **This was the largest investment project of its kind that has been executed to date in South Africa**
- More than **207 tons of PM10, 194 tons of PM2.5** and **80 tons of SO₂** were avoided as a result of the offsetting projects
- **37 124 learners** were imparted with knowledge and exposed to air quality topics
- **Job opportunities were created** and local small micro medium enterprises (SMMEs) were empowered and offered various services in the implementation of the project
- The project included the following initiatives
 - **Insulation of RDP houses, swapping coal stoves for gas heaters and stoves**
 - Veld, informal housing and waste fire management
 - Waste fire emission reduction
 - Vehicle emission testing
 - Education and awareness campaigns

Waste management

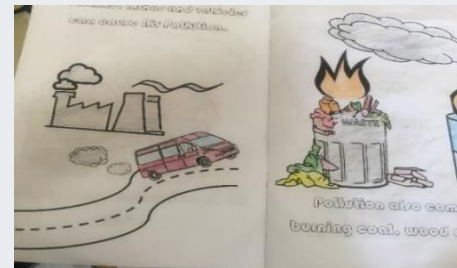


5 532 RDP houses were insulated

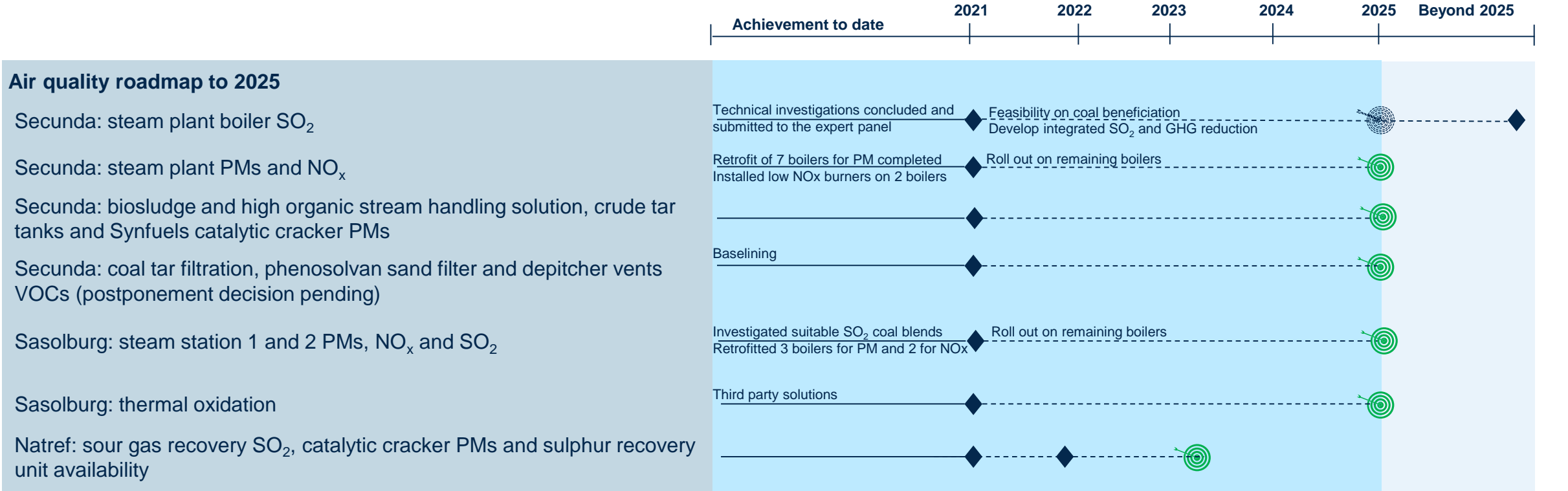


Before insulation → Sprayed ceiling → Ceiling board fitted and painted

37 124 learners reached through our education and awareness campaigns



We have made significant progress and are in the last stretch of our air quality compliance roadmap journey



PMs - particulate matter; SO₂ - sulphur dioxide; NO_x - nitrous oxides

Our commitment and intent remain to achieve compliance to the MES by 1 April 2025, for all point sources, except for boiler SO2 emissions from the steam plant at the Secunda Operations which will extend beyond this timeframe

There is one remaining challenge : timeous boiler SO₂ compliance at our Secunda steam plant operations



- **Sasol consistently communicated that meeting the boiler SO₂ emission standard remains a feasibility challenge for our Secunda steam plant operations**
 - In 2018 Sasol indicated to the Committee that meeting the (then applicable) new plant limit of 500 mg/Nm³ was not feasible for a mature plant
 - Sasol collaborated with the independent panel of experts who were appointed by the Minister of the Forestry, Fisheries and Environment to provide technical input towards effective management of SO₂ emissions from maturing plants and presented on assessed sustainable solutions for SO₂ emission reductions from existing mature plants
 - In November 2019, Sasol submitted a comprehensive report to the panel with detailed explanations on the extensive technical investigations which Sasol conducted regarding potential abatement of SO₂ emissions from its existing boilers
 - Sasol highlighted that the implementation of flue gas desulphurisation technology for boiler SO₂ abatement is complex with **unintended consequences such as significant cross media impacts, including on water, waste and carbon dioxide**
 - Subsequently the **MES were changed in March 2020 to provide for a limit of 1000 mg/Nm³** which Sasol views as a reasonable limit which it can achieve, albeit through significant effort
- **Coal beneficiation has the potential to reduce SO₂ emissions to achieve the promulgated standard of 1000 mg/Nm³. However, due to the magnitude and complexity of implementation, execution will likely extend beyond 1 April 2025**
 - Coal beneficiation, however, is not aligned to Sasol's sustainability objectives and long-term vision of **moving away from coal**
 - Feasibility work on coal beneficiation continues while **we are exploring synergies with GHG reduction initiatives considering Sasol's long-term ambition to transform our operations to low carbon options**

Air quality compliance – concluding remarks



- **We remain committed to ambient air quality improvement through compliance**

- The Sasol integrated value chain has 701 emission sources, of which 560 (80%) were compliant with the MES in 2014 already
- Our subsequent compliance achievements enabled that 686 emission sources (98%) are currently compliant to the MES, with the remainder of the emission sources to achieve compliance by 1 April 2025 through execution of air quality compliance roadmaps along extended timeframes obtained through lawful postponements. Accordingly, our mature, existing plants will comply with the same standards applicable for newly commissioned plants
- We are advancing the boiler SO₂ compliance roadmap for our steam plant operations in Secunda to meet the recently promulgated limit of 1000 mg/Nm³. However, due to the magnitude and complexity of the implementation execution will likely extend beyond 1 April 2025

- **We have made demonstrable improvements with regards to air quality through our on-site investments and offset programmes**

- **We are in the final stretch of our compliance journey. We advance and implement innovative solutions through our air quality compliance roadmaps along permissible extended timeframes**

- We are on track with our abatement projects for the few remaining sources to meet the MES standards for newly commissioned plants by 1 April 2025 in accordance with the conditions of our AELs
- Our air quality compliance roadmaps considered alternative feedstocks, optimised processes, improved efficiencies and focused abatement technology retrofits

- **We are positioning for a sustainable future**

- We are advancing air quality improvement synergies with GHG reduction objectives considering Sasol's ambition to transform our operations. We are cautiously optimistic about the potential of these integrated solutions which could reduce both our GHG emissions as well as improving our air quality parameters



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Sasol's greenhouse gas reduction strategy

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Our climate change management response



- A **holistic response** has been adopted - focusing on reducing our large emissions and increasing resilience of our business, community and people to the impacts of climate change
 - A **2030 target of at least 10% GHG reduction, off a 2017 baseline for our South African operations** has been adopted and is **under review towards a higher ambition reduction target**, supported by a roadmap of intervention projects to reduce emissions
- The **Future Sasol long term vision sees gas (transition feedstock) and later green hydrogen with associated renewables as critically important** for the country and our own operations
- Leveraging our feedstock **agnostic proprietary Fischer-Tropsch technology** and competitive advantage in fuel switching and grey hydrogen production to advance our ambitions for greater reductions

Three-pillar emission-reduction framework

Reduce emissions

- Pursuing energy and process efficiencies and integration of renewable energy

Transform operations

- Transforming operations through alternative feedstocks, e.g. transition gas, hydrogen

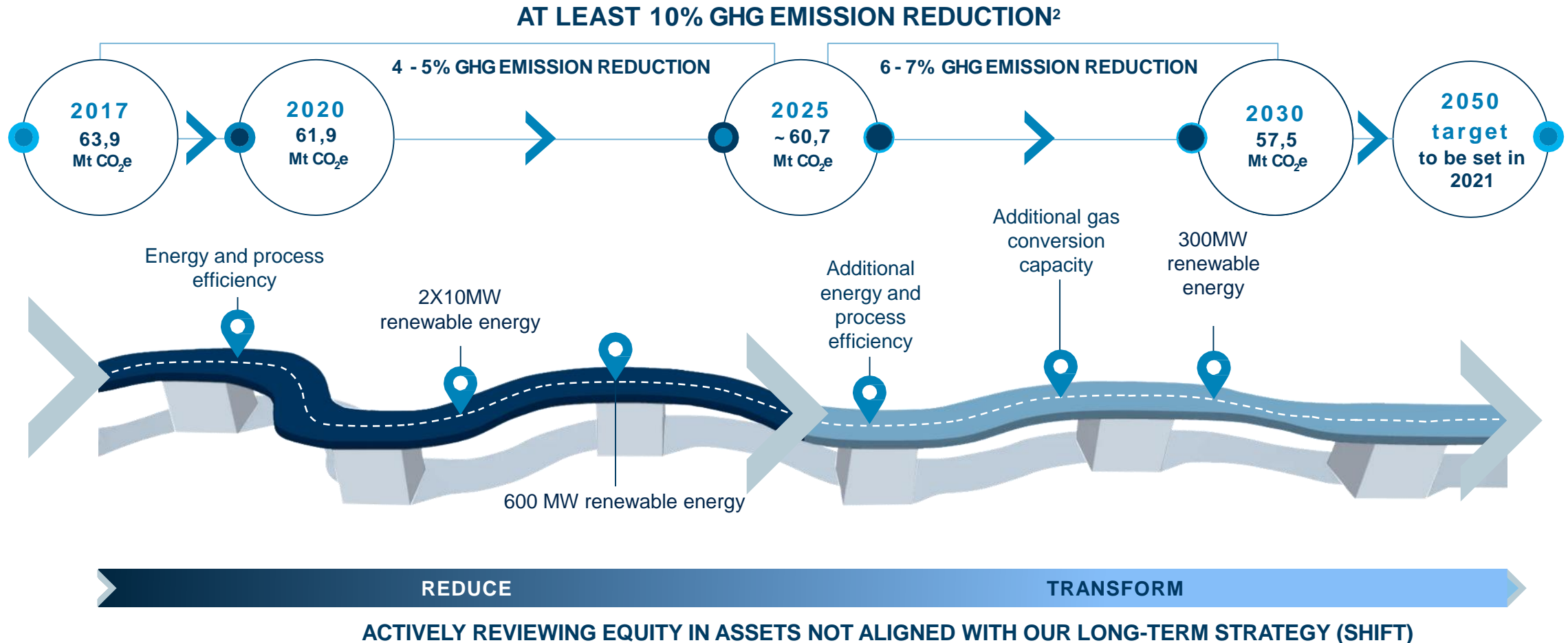
Shift portfolio

- Shifting portfolio to businesses and products more suited for a low carbon economy

Enabling initiatives and partnerships

- **Scope 3 emissions generated indirectly in our value chain require holistic reduction efforts over the medium to long term**
 - Working with customers and suppliers to quantify and reduce emissions through various metrics/frameworks
 - Use of carbon offset to complement three-pillar framework – RFI issued to market

Sasol is on track to deliver on our 2030 GHG emissions reduction target for South Africa¹ and our 2050 ambition and roadmap will be announced at our Capital Markets Day (CMD) in September 2021



Our 2030 GHG reduction target is under review with the outcomes to be announced at our Capital Markets Day;
To date we have achieved a 16% reduction in emissions since 2004

Our purpose – innovating for a better world – underscores our Future Sasol low carbon aspirations where hydrogen and renewables are envisaged to make up a significant part of our feedstock and energy requirements



Green hydrogen presents unique opportunities

The world is not yet meeting its **climate change goals** and hydrogen is a big part of the answer to achieve global net zero ambitions

Global hydrogen demand is **expected to grow ~6-10x vs 2020** volumes, accelerating after 2030 to enable deep decarbonisation¹

South Africa boasts one of the world's **largest renewable energy endowments**, making it well-suited to green hydrogen production to supply domestic and export markets

Green hydrogen is core to Future Sasol and our decarbonisation strategy; enabled by our deep hydrogen production, market experience and proven FT technology positions

The journey to green hydrogen commercialisation has started

Our ambition is to co-create South Africa's hydrogen ecosystems through strategic partnerships, leveraging our proprietary technology and integrated value chain to kick start a hydrogen economy

Focus (areas under consideration) for the next 3-5 years:

- Creation of **hydrogen hubs (with proof of concepts)**
- **Heavy-duty mobility** in SA
- Piloting opportunities to reposition SA assets to provide **sustainable liquids (SAF) and chemicals**
- Exploring greenfield opportunities at scale focusing on potential **export markets**
- Develop **new global PtX opportunities** enabled by our PtX propriety technology
- **Enabling regulatory framework**

PtX: Power to liquids | FT: Fischer-Tropsch



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Closing remarks: Future Sasol aspirations

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Closing remarks



- Sasol is a responsible and compliant operator
- **We will meet the MES for newly commissioned plants save one (boiler SO₂ at our Secunda steam plant operations) by 1 April 2025.** Consequently, **we are developing pathways to achieving SO₂ compliance, including exploration of synergies** with our GHG emission reduction programme that could see earlier benefits and reductions in SO₂
- **We have invested significantly in offset programmes** resulting in the avoidance of emissions of more than 207 tons of PM10, 194 tons of PM2.5 and 80 tons of SO₂ in the surrounding community/airshed
- We are unequivocal in our belief that **climate change is a real and urgent issue**. We are committed to continuing to play our part in the Just Energy Transition
- In this regard, Sasol is **on track for announcements on its review of its 2030 GHG emissions reduction target and a 2050 reduction ambition** for our South African Energy Operations
- Further, we are **aggressively pursuing alternative feedstock options** particularly **green hydrogen** which we believe could significantly **transform our operations and the energy sector in South Africa**

We thank the Portfolio Committee for this opportunity and extend an invitation to you to visit our operations in Sasolburg and Secunda