future, now
Sasol Technology research and development
future
- the indefinite time yet to come
- a prospective condition concerning advancement

“Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less.”

Madame Marie Curie

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Sasol is an international, integrated energy and chemicals company that creates value through its proven alternative fuels technology and talented people to provide sustainable energy solutions to the world.

Sasol has been a frontrunner in technology innovation and excellence since inception in the 1950s, to address the need for energy security in South Africa – a country with no significant oil reserves.

Today we produce more than 120 different products and are listed on the Johannesburg and New York stock exchanges in South Africa and the USA, respectively. We have operations in 38 countries and employ more than 34 000 people.

"Research and development, or R&D, is the creative work undertaken on a systematic basis to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications."

The Organisation for Economic Cooperation and Development

Technology is at the core of Sasol and is fundamental to our sustainability and competitiveness. As market needs and expectations change, our services and products are required to reflect the spirit of the age and the need of the day. Continuous and effective innovation of our technology can only be derived from an optimal research and development (R&D) function, informed by a strategic view of the economic landscape.

R&D falls within Sasol Technology, a subsidiary company and strategic business partner to other business units within Sasol. Sasol Technology plays a vital role as it directs, acquires, commercialises, installs and optimises technology for the group.

Did you know?

- Sasol contributes just under 5% of South Africa’s Gross Domestic Product (GDP).
- Sasol produces about 34% of South Africa’s total liquid fuels requirements and 15% of the aviation fuel supply to OR Tambo International Airport, Southern Africa’s busiest air transport hub.
Sasol’s research and development (R&D) enterprise was started in 1957 and has relied on superb personnel, excellent facilities and good systems to deliver the fundamental understanding and technical opportunities that ensure the group’s sustainable growth and profitable operation.

R&D delivers value to Sasol by developing new processes and products and supporting existing operations and businesses. Central to our research efforts is the continuous drive to minimise Sasol’s environmental footprint (legacy, current and future).

At R&D we want to be leaders in clean technologies to sustainably convert coal, gas and renewable resources into energy and chemical products.

The teams of dedicated employees at our facilities have been responsible for R&D’s consistently exceptional contributions and successes for more than five decades. Our employees are primarily engineers and scientists, expertly supported by technical, operational and administrative personnel.

R&D mainly employs people with qualifications in the fields of chemistry and chemical engineering. Our South African team consists of more than 600 members, many of whom have postgraduate degrees and years of experience in their fields.

**Did you know?**

- Sasol Technology R&D produces over 200 publications and conference presentations annually and has been granted 144 patents over a 10-year period.
- Sasol’s average R&D intensity is 1.09% (1998–2008).
At the University of St Andrews, our team provides specialist fundamental understanding, advanced characterisation and modelling in chemistry. The safety and health of our team is our highest priority. We consistently strive to maintain a safe workplace by proactively managing all risks.

Did you know?

- Sasolburg is not only the historical site of Sasol’s first Fischer-Tropsch plant but today remains the centre for all corporate R&D activities within the Sasol group.

“A global network of collaborations with other companies, universities and research institutes support our R&D.”

Geographical spread, facilities and networks

Our R&D teams are based mainly in Sasolburg, 80 kilometres south of Johannesburg, where our state-of-the-art facilities include: world-class laboratories; sophisticated analytical equipment; pilot plants; maintenance workshops; and a library. We also operate a small R&D centre in Secunda, which directly supports Sasol’s operations.

Our South African resources are complemented by research teams in Enschede in The Netherlands and at the University of St Andrews in Scotland. In Enschede, a small team of specialist chemical engineers focuses on fundamental research in reactor engineering, process modelling and optimisation.

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Value chain disciplines

Our R&D activities are divided into six primary technology areas:

- Coal and Gas Processing Technologies;
- Fischer-Tropsch Catalysis and Engineering Research;
- Refinery Technologies;
- Chemical Technologies;
- Environmental Sciences and Engineering; and
- Alternative Energy.

Our research efforts are enabled by facilities, which are designed, built, maintained and operated by a superb support services function.

The research support and integration team manages the project portfolio, strategy process, intellectual property administration, university collaborations and business support systems within R&D.

The analytical solutions team provides support to all six technology areas, addressing challenging analytical problems and performing materials characterisation in support of our catalyst developments. The team also provides advanced molecular modelling and industrial statistics support.

**R&D Structure**

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**Coal and Gas Processing Technologies**

The heterogeneous nature of coal (and most naturally derived solid feedstocks such as biomass) has seen the development of a vast array of conversion technologies from gasification and pyrolysis to combustion and direct liquefaction – each unique in its own right. However, the conversion of solids into gas is only part of the story, with aspects such as feed characterisation and product processing – both liquid and gaseous – demanding as much attention as the actual conversion step. These wide-ranging considerations have made for a very diverse and exciting technology field both in the domains of fundamental science as well as in the engineering disciplines, whether process or mechanical engineering.

Sasol continues to develop its proprietary Fixed Bed, Dry Bottom (Sasol FBDB) gasification and related technologies, while maintaining an in-depth understanding of alternative conversion technologies such as entrained flow gasification and underground coal gasification.

The empirical nature of solids conversion technologies necessitates strong analytical support and the R&D analytical solutions team provides solutions based on a detailed understanding of coal and its behaviour during processing. It also provides a comprehensive understanding of how to process valuable co-products in a cost-effective and environmentally sustainable manner.
Coal and Gas Processing research in action:

Over the years, the coal and gas processing technologies team has had the privilege of contributing to Sasol’s continued success on a wide variety of fronts, ranging from the development of a novel re-carburiser/anode coke process to improving the production capacity of the Synfuels gasifiers by more than 50% above the original design, the latter purely by virtue of improved feed coal characteristic understanding.

More recent milestones include:

• The successful demonstration of a Coal Stirrer-Distributor (“CSD”) device to enable the processing of caking coal. Part of this programme included the largest commercial-scale Test Gasifier campaign to date, which involved the processing of more than 26 000 tons of coal. During the course of the campaign, R&D managed the collection and detailed characterisation of more than 16 tons of coal samples.
• The development of advanced separation technology options for the more cost-effective and efficient recovery of coal-derived co-products in collaboration with international development partners.
• Enhancement of the reactor design for the Mk V Sasol FBDB gasifier, which now serves as the preferred technology option for future facilities.
• Establishment of a Discreet Element Modelling and Cold Flow programme in pursuit of component-level gasifier improvements.
• Ground-breaking work in the method and techniques utilised for the measurement of coal Ash Fusion Temperatures, specifically in the emerging field of coarse coal particles.
• Collaboration with various national and international academic institutions as far afield as the UK and USA towards an improved understanding of co-product formation during the gasification process and the resultant product properties and yields.

Did you know?

• The Sasol Synfuels gasification facility, where a total of 84 Mk IV “Sasol FBDB” gasifiers are deployed, constitutes the single largest gasification plant in the world and accounts for more than 75% of global coal-derived syngas production!

Focus areas include:

Feedstock characterisation
• physical and chemical properties of coal and other feedstock options such as petroleum coke and biomass;
• feedstock supply value chain optimisation including coal preparation, blending, beneficiation and homogenisation; and
• matching gasification technologies to feedstock characteristics.

Coal and gas conversion technologies
• Sasol FBDB gasification technology;
• underground coal gasification;
• high-temperature gasification;
• fluidised bed gasification;
• pyrolysis and direct liquefaction;
• coal combustion; and
• natural gas reforming.

Synthesis gas treatment
• gas cooling and cleaning;
• synthesis gas conditioning, for example: acid gas removal; sulphur recovery; shift conversion; and methanation; and
• trace element removal.

By-product processing
• condensate separation via the proprietary Sasol GLS Process;
• Tar and oil filtration and processing; and
• sulphur, aqueous chemicals, for example: phenol and ammonia recovery.

Coal and Gas Processing research in action:

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Fischer-Tropsch Catalysis and Engineering

Research

\[(2n+1) \ H_2 + n \ CO \rightarrow C_nH_{(2n+2)} + n \ H_2O\]

The Fischer-Tropsch reaction is at the core of Sasol’s gas-to-liquids (GTL) and coal-to-liquids (CTL) processes. This technology is used to convert synthesis gas into a range of valuable fuel and chemical components. Sasol has commercialised and continues to develop a range of catalyst and reactor systems as integrated process technologies for synthetic fuels and chemicals production. The team involved is responsible for maintaining Sasol’s technical leadership in this key area of our business by optimising the synthesis reactions to produce the desired building blocks for fuel and chemicals production while reducing costs and driving process efficiency.

Focus areas include:

- Iron Catalysis
  - high temperature – fluidised bed; and
  - low temperature – slurry bed; fixed bed.
- Cobalt Catalysis
  - low temperature – slurry bed.
- Integrating catalyst science and engineering
  - selectivity, activity, stability;
  - deactivation, catalyst management, regeneration;
  - catalyst manufacturing protocols;
  - catalyst production support;
  - catalyst modelling and performance evaluation;
  - catalyst handling and reclamation.
- Gas loop modelling and optimisation
- Reactor design
  - piloting, modelling and optimisation;
  - hydrodynamics, heat and mass transfer, solids handling;
  - commercial reactor specification.
- Fischer-Tropsch research in action:
  - The Oryx GTL plant in Qatar is a 34 000-oil-barrel-(bbl)-per-day facility that converts natural gas into high-performance, environmentally friendly diesel.
  - A joint venture between Sasol and Qatar Petroleum, it uses Sasol’s proprietary Slurry Phase Distillate process.
  - R&D started work on the cobalt-based Sasol Slurry Phase Distillate process for Oryx in the early 1990s. We followed a systematic, phased approach for the development of this new technology, addressing specific aspects of the commercialisation in each phase.
  - The first phase entailed testing a range of catalyst formulations at a micro-reactor scale (100g). Once successful, we upped the catalyst preparation to pilot plant scale (10-15kg) and tested it in the pilot plant slurry bed reactors. This was the first attempt to place the catalyst in a synthesis environment similar to that expected in a commercial reactor.
  - Next, we prepared the successful catalyst on a demonstration scale (1 ton) through trials at a catalyst manufacturing plant in De Meern in The Netherlands, as a joint venture with BASF. This trial was the final verification of a scale-up of the catalyst preparation, after which we constructed a 500-ton-per-annum commercial production facility, completed in 2002.
  - We tested the catalyst from the demonstration trials in a demonstration reactor: a 1m-diameter, 100-bbl-per-day slurry bed reactor, which provided information on hydrodynamics, heat transfer, product spectrum and mechanical integrity.
  - Using the information obtained from lab, pilot plant and demonstration scale with Sasol’s reactor development and scale-up history, we successfully scaled up the slurry phase reactor from 100 to 17 000 bbl per day.
  - Ongoing, active R&D programmes in Sasol are well on track to deliver further improvements in the areas of catalyst and reactor performance. This will result in improved performance and cost reduction.

Did you know?

- The Fischer-Tropsch process was developed in Germany in the 1920s and was subsequently evolved by Sasol. Our proprietary technology has taken the beneficiation of hydrocarbons to unprecedented levels.

“Sasol has commercialised and continues to develop a range of catalyst and reactor systems as integrated process technologies for synthetic fuels and chemicals production.”
Historically, the octane number of the hydrogenated CatPoly petrol was below 70 and therefore limited the quality of the fuel that could be produced in the refinery. This prompted a comprehensive programme at R&D, starting in the late 1990s and still ongoing, to investigate the fundamentals of the process. We probed the process at every level from fundamental catalysis and reactor design to process integration into the overall refinery. The factors that control the octane were carefully identified and understood, ultimately allowing a number of changes to be made to the commercial facility, resulting in octane numbers close to 90. Plans are in place to increase this further on a sustainable basis.

Complementary interdisciplinary research programmes have also yielded improvements in other areas, including next-generation catalyst designs for improved catalyst life, innovations such as benzene mitigation through in situ alkylation to adhere to tightened fuels specifications, and even demonstrating how the spent catalyst can be converted into environmentally friendly fertiliser.

Refinery Technologies

Sasol continuously develops refining processes to meet the transport industry’s increasingly exacting fuels specifications.

We carefully refine fuel components produced during coal processing and in our synthetic fuels processes to yield petrol, diesel and jet fuel that meet local and international market requirements.

The refinery technologies team undertakes in-house research programmes and works with technology partners to develop solutions that improve plant yields, optimise environmental performance and drive energy as well as cost efficiency.

Focus areas include:

- Fischer-Tropsch Refinery Catalysis
  - hydrogenation;
  - hydrotreating and hydrocracking;
  - isomerisation and hydrosisomerisation;
  - catalytic polymerisation; and
  - platforming;

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- Tar Refining

- Cracking Technologies

- Reactor Design and Flow Sheet Integration

- Operations Support
  - catalyst optimisation;
  - understanding side reactions and contaminations;
  - catalyst recovery; and
  - corrosion chemistry.

Refinery Technologies research in action:

The Catalytic Polymerisation (CatPoly) process has been one of the key pillars of the Sasol Synfuels refinery in Secunda for nearly 30 years. It is the main tool for upgrading light olefins into petrol, synthetic jet fuel and diesel, and contributes more than a third of the Synfuels petrol production volume.

“We carefully refine fuel components produced during coal processing and in our synthetic fuels processes to yield petrol, diesel and jet fuel that meet local and international market requirements.”
Sasol has developed and commercialised a number of processes to recover high-value chemicals from the coal by-product and Fischer-Tropsch product streams at its integrated facilities.

We employ innovative separation and reaction steps to recover and transform a range of olefins, oxygenates and phenols, amongst others, for sale into the chemicals market. This is complemented with the targeted development of processes that use traditional feedstocks, with a view to growing and consolidating our chemicals business as well as capitalising on adjacent or growth opportunities.

Focus areas include:

- Olefin manipulation
  - oligomerisation;
  - metathesis;
  - hydroformylation, and
  - homogeneous catalysis and ligand synthesis.

- Assorted chemical transformations
  - hydrogenation;
  - dehydration; and
  - etherification.

- Syngas-to-chemicals options

  - Separation technology for the isolation and purification of high purity chemicals
    - distillation (conventional, extractive and azeotropic);
    - liquid-liquid extraction; and
    - catalytic distillation, membranes and adsorbents.

Sasol has an established global business in linear alpha olefins (LAOs) such as 1-hexene and 1-octene, which are used as co-monomers in polyethylene production. Historically, we have selectively extracted these components from our Fischer-Tropsch treasure chest in Secunda, giving us an edge over competitors who make a range of less valuable products in addition to the valuable co-monomers via ethylene oligomerisation. Sasol is now extracting all the available 1-hexene and 1-octene from Secunda, using in-house-developed separations technology, and is also converting Fischer-Tropsch-derived 1-heptene to 1-octene (through hydroformylation and dehydration, the latter being proprietary technology). We must therefore look to other technologies to grow our co-monomers business.

In 1997 R&D began researching selective ethylene trimerisation as a route for 1-hexene production. This research led to the development and patenting of six ethylene trimerisation catalyst systems. More significantly, in 2002 the same research group discovered an ethylene tetramerisation catalyst system which produces predominantly 1-octene together with some 1-hexene. Before Sasol demonstrated this, the selective production of 1-octene from ethylene was considered impossible by experts in the field. An intensive optimisation effort culminated in economically viable selectivities and activities by 2006.

Scale-up from small batch reactors to a 5-litre continuous system revealed significant operational challenges due to the accumulation of an unwanted trace by-product. Two miniplant campaigns were undertaken to better understand these challenges, leading to the conclusion that we would have to develop our own unique reactor technology. An extensive piloting and chemistry optimisation campaign with close interaction between scientists and engineers followed and, by mid-2009, we had developed a viable reactor technology.

The tetramerisation project was approved for Basic Engineering in late 2009. The first plant, 100 kilotons per annum (ktpa), will be commissioned and operational at Sasol North America’s Lake Charles Chemical Complex in Louisiana in 2013.

Chemical Technologies research in action:

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Did you know?

- Sasol is a world leader in co-monomer production.

  - We currently produce 23% of the 1-hexene and 27% of the 1-octene global market. With tetramerisation online, we will maintain our 1-hexene market share and boost our 1-octene market share to 31%. This corresponds to 265 ktpa 1-octene!
Managing the environmental impact of Sasol’s massive operations in a cost-effective and sustainable manner is an enormous challenge. Continuous R&D work is imperative to reduce the footprint of our operations, anticipate future challenges and develop options for eliminating or mitigating emissions.

Coal-based operations located at inland sites represent a particular challenge. The effective management of water resources, salts, ash streams, solid wastes and atmospheric emissions is fundamental to Sasol’s sustainability and our team is striving to ensure that clean, efficient and reliable technologies are available at all Sasol’s sites.

Focus areas include:

**Water Management Research**
- treating and upgrading wastewaters for reuse or discharge;
- water efficiency optimisation;
- residue (salt) management and disposal; and
- characterisation of wastewaters.

**Solid Waste Management**
- minimisation, reuse, recycling and safe disposal.

**Atmospheric Impact Research**
- quantification and analysis of emissions;
- atmospheric pollution modelling and impact assessment; and
- atmospheric chemistry.

**Ecotoxicology**

**Biosystems evaluation and Biomonitoring**

Environmental Sciences and Engineering research in action:

Sasol’s GTL and CTL processes consume large quantities of fresh water for process cooling and steam generation. R&D has developed a number of treatment technologies that allow wastewaters generated by both the Sasol FBDB coal gasification and the Sasol Slurry Phase Distillate processes to be recovered and reused, thus improving the overall water use efficiency of our CTL and GTL technology offerings.

Extensive research went into the development of the wastewater treatment and recovery unit currently employed at the Oryx GTL facility in Qatar. This unit treats around 7 million litres per day of mainly Sasol Slurry Phase Distillate process wastewater, and a large portion of the treated wastewater is then directly reused as process cooling water. Following the Oryx success, a second-generation, membrane-based technology, which is more compact and energy efficient, has been developed. The treated water arising from this second-generation technology can be used directly as process cooling water or boiler feedwater, following a secondary polishing step. In essence, it is now possible to efficiently reuse all the wastewater produced in a GTL facility, thus providing a major water-saving benefit.

The development of key wastewater treatment technologies and the intelligent integration of these technologies into CTL and CTL designs enhance the environmental sustainability of our technology offerings and contribute to our leadership in the conversion of coal and natural gas to liquid fuels, fuel components and chemicals.
Looking beyond fossil fuels

Solar
- photovoltaics
- concentrated solar power

Energy storage
- thermal storage
- batteries
- alternative concepts

Integration of low-carbon energy
- biomass
- nuclear
- hydroelectric

Efficiency and energy recovery

Alternative Energy

As a leading player in the supply of fuels for transportation and other purposes, Sasol’s longer-term future depends on our ability to respond to the global challenge of reducing CO₂ emissions and creating energy options beyond fossil fuels.

The options for deriving energy, especially electricity, from noncarbon sources including solar, hydroelectric, nuclear, wind and renewable resources such as biomass, require careful technical evaluation and targeted development work.

The alternative energy team leads with fundamental technical evaluations and drives the development programmes that will be needed to integrate alternative energy solutions into Sasol’s existing processes and potentially create the basis for new businesses.
Corporate social responsibility

Fundani Nathi community outreach

In 2005, nine Sasolburg-based R&D scientists started the Fundani Nathi Tutoring Project (FNTP) as a voluntary initiative. Their aim was to enhance the grades of Grade 12 learners from the nearby community, with a strong emphasis on mathematics and physical science.

Motivated by the skills shortage in sectors that require a good foundation in science and engineering, the project now constitutes an entire group of passionate engineers and scientists who voluntarily offer three hours of their time every Saturday morning to tutor Grade 12 learners from Nkgopoleng and Cedar Secondary Schools in Zamdela, Sasolburg.

The FNTP also incorporates career guidance and informal mentoring and runs throughout the year, only breaking for exams.

Did you know?

“Fundani Nathi” is a Zulu phrase meaning “Learn with us.”

“The aim was to enhance the grades of Grade 12 learners from the nearby community, with a strong emphasis on mathematics and physical science.”

University Collaboration Initiative

Sasol’s University Collaboration Initiative is aimed at building competency in the fields of science and chemical engineering and ensuring the long-term supply of highly trained postgraduates for Sasol and other South African industries or universities. Through this collaboration initiative, universities are able to work with Sasol’s research resources, while Sasol is able to complement its own research efforts and capabilities by leveraging academic excellence to assist with the effective execution of R&D projects. Sasol is investing R250 million over 10 years in support of this initiative.

Eleven universities were selected for their specific expertise in various areas of research that are of interest to Sasol. For example, at the University of KwaZulu-Natal, a centre of excellence in chemical thermodynamics has been established. At Stellenbosch, the focus is on creating a centre of excellence in separations technology, specifically in the fields of applied thermodynamics, super-critical extraction, liquid-liquid extraction and mass transfer.

“Sasol is investing R250 million over 10 years in support of the university collaboration initiative.”
Sasol’s history of technology innovation

1950:
- Sasol formed to convert coal to liquid fuels and chemicals via Fischer-Tropsch synthesis

1955:
- First coal-to-liquid (CTL) facility in Sasolburg comes on line (Sasol 1)
  - The first flare from Sasol 1 indicates Kellogg synthesis is working and by the end of that year cars could fill up with Sasol petrol.

1957:
- Sasol Technology R&D formed to support existing operations and develop new processes and products
- Development of ARGE and synthol catalysts for wax and fuel production via Fischer-Tropsch synthesis

1957 - 1960:
- Development of ARGE and synthol catalysts for wax and fuel production via Fischer-Tropsch synthesis

1967:
- ARGE catalyst manufacturing plant in Sasolburg commissioned

1974:
- Sasol 2 in Secunda announced

1979:
- Sasol 3 in Secunda announced

1980:
- Sasol 2 construction completed

1980s:
- Chemicals opportunities investigation commenced; monomers and solvents extraction from Fischer-Tropsch
- Design of Sasol Advanced Synthol (SAS) reactors commenced to replace Kellogg circulating fluid bed reactors

1981:
- Design of Sasol Advanced Synthol (SAS) reactors commenced to replace Kellogg circulating fluid bed reactors

1982:
- Sasol 3 comes on line

1982:
- SAS demonstration reactor commissioned

1989:
- 5-metre SAS reactor demonstrated
- 100 bbl/day Slurry Phase demonstration reactor commissioned

1990s:
- Chemicals opportunities investigation continued; monomers and solvents extraction from Fischer-Tropsch
- New processes and products development
- Cobalt-based Fischer-Tropsch catalyst development commences
- 17 000 bbl/day Slurry Phase Distillate reactor design for gas-to-liquid (GTL) commences

1990:
- After extensive research and development, Sasol SMX launched its unique Expan technology to world mining explosives
- High purity ethanol plant comes on stream in Sasolburg

Key:
- Sasol Limited
- Sasol Technology R&D

R&D history
1992:
• 2 500 bbl/day Sasol Wax slurry bed comes on line

1994:
• Twin train hexene/pentene plant commissioned

1995:
• First SAS reactor comes on line

1996:
• The first on-specification n-propanol product is produced in Secunda

1998:
• Anode coke plant comes on stream

1999:
• Synthol reactors replaced with SAS reactors
• New high purity ethanol plant comes on line in Secunda
• Octene Train 1 commissioned
• First semi-synthetic jet fuels developed

2000:
• Hexene Train 3 commissioned

2000s:
• Tar Naphtha Phenolic Extractions (TNPE) process development
• New processes and products development
• Ethylene tetramerisation
• Development of Cobalt slurry phase GTL technology continues

2001:
• Ninth SAS reactor comes on stream

2002:
• Ethyl acetate plant start-up
• Safol commissioned
• Octene Train 2 plant commissioned
• Cobalt Fischer-Tropsch catalyst commercialised (500 tps)
• Superflex Catalytic Cracker (SCC) support
• Highly selective ethylene tetramerisation catalyst discovered

2003:
• Hydrodesulphurisation Unit commissioned

2005:
• SCC start-up
• State-of-the-art 34 000 bbl/day Oryx GTL plant in Qatar commissioned
• TNPE plant commissioned

2006:
• Octane Train 3 plant commissioned
• 3% benzene spec in petrol achieved
• First fully-synthetic jet fuel developed
• Catalyst Testing Reactor and Fischer-Tropsch Design Reactor commissioned to further enhance GTL/CTL offering

2008:
• Catalyst Testing Reactor and Fischer-Tropsch Design Reactor commissioned to further enhance GTL/CTL offering

2009:
• Sasol advanced fuels lab opened in Capricorn Park, Cape Town

2010:
• Sasol conducted the world's first commercial flight using fully-synthetic jet fuels

2011 and beyond:
• World's first tetramerisation plant to be commissioned
• New CTL and GTL plants

2011 and beyond:
• New products and processes continue to be developed
• Continued reduction in Sasol's environmental footprint
• Alternative energy research ramps up
“If we knew what it was we were doing, it would not be called research... would it?”

Albert Einstein
Our shared values

- Customer focus
- Winning with people
- Safety
- Excellence in all we do
- Continuous improvement
- Integrity