

# Coal extraction & synfuels

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 Climate Mitigation Services  
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## Sasol, South Africa

www.sasol.com Rosebank, RSA

yellow column indicates original reported units

### Production / Extraction data

Year	Lignite		Hard Coal		Total Coal	
	Gross production Million tons/yr	Gross production Million tonnes/yr	Gross production Million tons/yr	Gross production Million tonnes/yr	Gross production Million tons/yr	Gross production Million tonnes/yr

Sasol mines coal (exported as well as used for syngas and synthetic liquids production)  
 Sasol also produces minor quantities of gas and oil internationally (Mozambique, Gabon)



Sasol Annual Report 2010, page 29.

Sasol data		
0.03		0
0.26		0
1.12		1
1.39		1
1.77		2
1.91		2
2.01		2
2.08		2
2.31		2
2.39		2
2.30		2
2.33		2
2.87		2
3.36		3
3.59		4
3.90		4
3.87		4
4.09		4
4.19		4
4.52		5
4.54		5
4.65		5
4.62		5
4.77		5
5.85		6
7.01		7
8.24		8
13.17		13
16.88		17
27.84		28
33.07		33
34.94		35
35.38		35
35.33		35
34.60		35
35.11		35
36.63		37
36.80		37
37.25		37
39.12		39
40.35		40
40.71		41
43.29		43
44.35		44
48.21		48
48.52		49
50.89		51
51.32		51
51.52		52
51.12		51
51.88		52
47.51		48
46.20		46
43.30		43
42.80		43
39.10		39
39.10		39
42.60		43
38.60		39
40.00		40
40.10		40
39.70		40
41.20		41
42.30		42
37.60		38
37.20		37

15.6
27.9
32.8
34.9
35.5
35.3
34.6
35.4
36.6
31.0
32.4
33.4

methane explosion claimed 53 lives in 1992

50.9
49.9
50.6
49.4
51.1

Sales million tonnes	
47.7	46.20
46.5	43.30
46.1	42.80
43.7	39.10
	39.10
	42.60
	38.60
	40.00
	40.10
	39.70
	41.20
	42.30
	37.60
	37.20

AnnRpt 2011, p 89.  
 AnnRpt 2013, p 93.  
 AnnRpt 2013, p 93.  
 AnnRpt 2015, p84  
 Sasol 20-F 2017  
 Sasol 20-F 2018  
 Sasol 20-F 2018  
 Sasol Integ Rpt 2019

<b>Total</b>	-	<b>637</b>	-	<b>1,646</b>	-	<b>1,646</b>
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Coal Types:	Lignite:	0.00%	Bituminous:	100.00%	Metallurg./Anthrac.	0.00%
		1953-2018 subtotal:		1,646	million tonnes	

Investor-owned

	% change	2013	2012
<b>Financial performance</b>			
Operating profit	Rm (3)	2 213	2 287
Operating profit margin	%	18.0	21.4
<b>Operational performance</b>			
Contribution to group operating profit			
	%	5.4	6.2
Total sales	Mt	44.5	42.8
Total production	Mt	40.1	40.0
Recordable case rate		0.57	1.02
Employee numbers		8 140	7 800
<b>Environmental performance</b>			
Direct greenhouse gas emissions (methane) <sup>1</sup>			
	Mt	0.02	0.02
Total water use <sup>1</sup>	Mm <sup>3</sup>	1.8	2.1

<sup>1</sup> From our exploration and production activities.

Sasol Mining

Sasol AnnRpt 2013, p. 95.

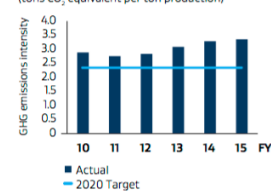
Other Sasol products: not added to coal prod

Sasol Petroleum International

oil sales million bbl	
1.7	2006
1.6	2007
1.8	2008
2.0	2009
na	2010
condensate sale million bbl	
0.45	2006
0.58	2007
0.50	2008
0.46	2009
na	2010
gas sales million GJ	
66.0	2006
68.5	2007
74.8	2008
74.7	2009
75.1	2010



Greenhouse gas (GHG) emissions intensity (tons CO<sub>2</sub> equivalent per ton production)



Sasol AnnRpt 2015, p 27.

129.9 AR 2010 p 33  
 2010 AnnRpt 2010

Sasol oil Mm <sup>3</sup>	
9.6	2006
9.7	2007
10.0	2008
42.2	2009
39.1	2010



AnnRpt 2012, p. 36

Sasol synfuels coal-based liquids million tonnes (Mt)		Synfuels coal-based liquids Mb	
7.54	2006	55.27	
7.33	2007	53.73	
7.40	2008	54.24	
7.10	2009	52.04	
7.38	2010	54.10	
7.29	2011	53.44	interpolated
7.20	2012	52.78	AR 2013 p.97
7.44	2013	54.56	AR 2013 p.97
7.12	2014	52.20	
7.68	2015	56.31	
7.78	2016	57.02	
7.83	2017	57.42	
7.59	2018	55.61	



**Cell:** I9

**Comment:** Rick Heede:

Historical Milestones:

Sasol established on 26 September 1950.

The original coal-to-liquids (CTL) complex at Sasolburg, South Africa, starts producing synthetic fuels and chemicals and the first eight drums of creosote – the first Sasol product – are dispatched in March 1955.

2003: Construction of pioneering and environmentally-friendly gas-to-liquids (GTL) venture outside South Africa at Ras Laffan, Qatar commences.

<https://www.sasol.com/about-sasol/company-profile/historical-milestones>

Also see; John Collings (undated) Mind over Matter: The Sasol Story: A half-century of technological innovation. [https://www.sasol.com/sites/default/files/content/files/mind\\_over\\_matter\\_07\\_1178173866476\\_0\\_1.pdf](https://www.sasol.com/sites/default/files/content/files/mind_over_matter_07_1178173866476_0_1.pdf)

Wikipedia: "Sasol Limited is an integrated energy and chemical company based in Johannesburg, South Africa. The company was formed in 1950 in Sasolburg, South Africa. It develops and commercialises technologies, including synthetic fuels technologies, and produces different liquid fuels, chemicals and electricity. Sasol is listed on the Johannesburg Stock Exchange and the New York Stock Exchange. Major shareholders include South African Government Employees Pension Fund, Industrial Development Corporation of South Africa Limited (IDC), Allan Gray Investment Counsel, Coronation Fund Managers, Investment Asset Managers, among others. Sasol employs approximately 34 000 people worldwide and has operations in 38 countries. It is the largest corporate taxpayer in South Africa."

**Cell:** H19

**Comment:** Rick Heede:

Sasol mining tonnages for Secunda and Sasolburg for 1953/1954 through 2004/2005 from "mining colleagues" at Sasol, 7July2005.

**Cell:** N30

**Comment:** Rick Heede:

Sasol Annual Rpt 2009, page 47: "Sasol Petroleum International (SPI) develops and manages the group's upstream interests in oil and gas exploration and production. Particular focus is given to securing more natural gas reserves with the aim of leveraging the group's proprietary technology and developing new gas-to-liquids (GTL) facilities.storage (CCS) solutions in support of the group's coal-to-liquids." Gas sales, condensate sales, and oil sales data below.

**Cell:** E48

**Comment:** Rick Heede:

Coal production for 1982 and 1983 from Sasol (1984) Annual Report.

Coal production for 1983 forward from Sasol (various) Annual Reports. Data reported by collieries and not totalled until the 1987 report.

**Cell:** E57

**Comment:** Rick Heede:

Sasol Annual Report for 1991 only reports production from Secunda Collieries; no mention of production from Sasol's Sigma Collieries.

**Cell:** E59

**Comment:** Rick Heede:

1993 production from Sasol (1994) Annual report, p. 12. Alos reports methane explosion at Secunda Collieries' Middelbult mine in March 1993, claiming 53 lives.

**Cell:** N60

**Comment:** Rick Heede:

AR 2010 pdf pg 39; report is MT sales and production (not Mm<sup>3</sup>), this # is production

**Cell:** E66

**Comment:** Rick Heede:

Coal production for 200-2002 from Sasol (2003) SEC Form 20-F, [www.sec.gov/index.htm](http://www.sec.gov/index.htm). Reports prior to 2003 not available from SEC website.

**Cell:** E69

**Comment:** Rick Heede:

Coal production 2003 and 2004 from Sasol (2005) Annual Report, p. 29. Sasol Mining produces and supplies coal to Sasol's synfuels division. In 2003 Sasol produced 7.28 million tonnes of synthetic liquid fuels (refined at Natref); 2004 = 7.67 Mt. Production slate in 2004 was 66 percent liquid and gaseous fuels, 20 percent petrochemical feedstocks, 11 percent carbon and nitrogenous feedstocks, and 3 percent "specialized cokes + creosote + related carbon and tar products."

Of the total coal produced in 2004, 402 Mt were supplied to the synfuels division and 6 to 7 Mt to Sasol's petrochemical division. Natural gas from Mozambique is slated to replace coal for synfuels production. p. 29. Sasol also reports 3,115 million cubic meters of crude oil processed in 2004, which (at 0.159 cm per bbl) equals 19.59 billion bbl. We conclude that the data units are in thousand (not million, as stated) cubic meters, meaning a refinery throughput of 19.59 million bbl. Liquid fuel sales are reported as 9,318 million cubic meters, or (once crediting proper units) equal to 58.60 million bbl; 2004 report, page 33. Sasol also reports gas sales of 52.9 million gigajoules (ie, petajoules, or PJ) in 2004, 48.7 PJ in 2003. Sales via "Spring Lights Gas,our 49:51 gas marketing joint-venture company with the Durban-based Coal Energy and Power Resources black empowerment company." p. 37.

We have not found evidence of Sasol's own extraction of crude oil or natural gas, and thus base the company's production on its coal operations alone.

**Cell:** N70

**Comment:** Rick Heede:

Sasol Annual Rpt 2009, page 37: "Sasol Synfuels operates the only commercial coal-based synfuels manufacturing facility in the world."2008 production of 7.4 million tonnes (sales of 7.5 Mt).

**Cell:** H72

**Comment:** Rick Heede:

Sasol Annual Rpt 2007, page 34, coal production in million tonnes; sales are 47.7 and 46.5 million tonnes for2006 and 2007.

**Cell:** H74

**Comment:** Rick Heede:

Sasol Annual Rpt 2009, page 31: total sales in 2008: 46.1 million tonnes; total production 42.8 million tonnes. Production chiefly at Secunda mining complex, also 1.8 Mt at Sigma Mooikraal Colliery; Secunda mines nearing depletion, proposing to develop new mines and shafts (R7 billion).

**Cell:** H76

**Comment:** Rick Heede:

AR 2010 pdf report pg 31

**Cell:** H79

**Comment:** Rick Heede:

Sasol Annual Report 2013, page 93.

**Cell:** N79

**Comment:** Rick Heede:

Sasol AnnRpt 2013, 130 pp.

Page 97: Synfuels: tottal production in 2013: 7.443 Mt (7.2 in 2012).

Page 99: Crude oil processed in 2013 is 2.637 MI (million liters?), total production 7.8 Mm<sup>3</sup> (8.1 Mm<sup>3</sup> in 2012)

**Cell:** H81

**Comment:** Rick Heede:

Sasol AnnRpt 2015, page 84, "saleable production" for 2014 and 2015. Excludes "external purchases" of 5.1 Mt and sales to customers (41.7 Mt plus 3.4 Mt export).

**Cell:** N81

**Comment:** Rick Heede:

Sasol AnnRpt 2015, page 88. Synfuels refined product 32.4 Mb, plus processed crude oil 19.8 Mb, 52.2 Mb / 7.33 bbl/tonne

**Cell:** H83

**Comment:** Rick Heede:

Sasol Limited 20-F June 2018, page 40, saleable domestic production, in Mt, for 2016-2018.

[https://www.sasol.com/sites/default/files/financial\\_reports/Sasol%2020-F%20Website%20Version.pdf](https://www.sasol.com/sites/default/files/financial_reports/Sasol%2020-F%20Website%20Version.pdf)

**Cell:** P96

**Comment:** Rick Heede:

Sasol Annual Rpt 2009, page 33: "Sasol Gas, which markets natural gas from Mozambique and methane-rich gas produced by Sasol Synfuels, sustained sales volumes at 122,2 million gigajoules (M GJ) in 2008."

Updated to 2013. However, Sasol Annual Reports or Form 20-F filed with US SEC do not contain detailed data on natural gas production -- primarily in Mozambique. Gas production is combined with syngas production, which is excluded insofar as the carbon in the mined coal is already accounted for in coal production.

We assume, lacking detail, that 70 percent of total gas production (natural and syngas) is natural gas.

**Cell:** D108

**Comment:** Rick Heede:

Sasol 20-F for 2018, p 39-40: "Mining operates seven mines for the supply of coal to the Secunda Synfuels Operations, Sasolburg Operations (utility coal only) and the external market. The annual production of each mine, the primary market to which it supplies coal and the location of each mine are indicated in the table above.