POLICY BRIEF

Understanding the Role of Subsidies in South Africa's Coal-Based Liquid Fuel Sector

October 2020
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Introduction

This policy brief analyzes the coal-to-liquid (CTL) fuel sector in South Africa, exploring the role of subsidies in driving the consumption of coal-derived fuels. It focuses on the various support measures that have and continue to benefit the CTL industry. The CTL industry is monopolized by Sasol, a company minority-owned by the South African government. Two subsidy estimates are presented: one based on the market price support (MPS) to liquid fuels produced from coal and the second based on the carbon tax exemption for Sasol. The results highlight the impact of fossil fuel subsidies on the consumers in and the environment of South Africa.

Context

Sasol runs the only commercial CTL plant in South Africa. Located in Secunda, this plant is also the single-biggest point source of greenhouse gases (GHGs) in the world (Sguazzin, 2020).

Synthetic fuels (synfuels) produced by Sasol supply roughly 30% of the total fuels in South Africa (Burton et al., 2018). As a former state-owned enterprise with some government shares still intact, Sasol continues to profit from various historical arrangements with the government, such as the fuel pricing mechanism and the recent carbon tax exemption (Skovgaard & van Asselt, 2018).

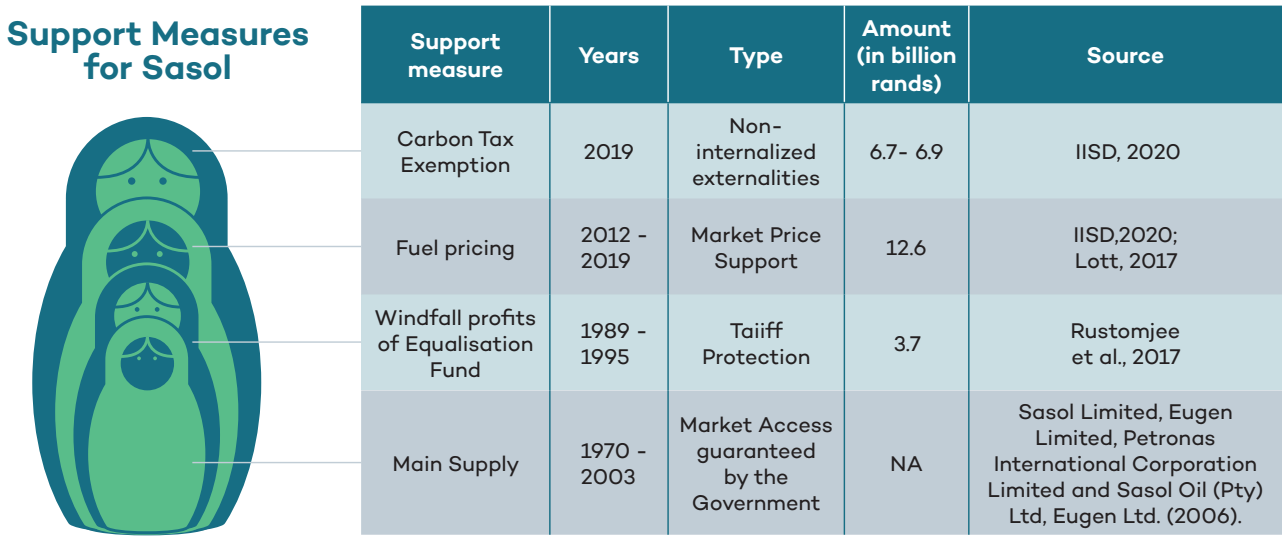
Although historical subsidies to Sasol have been justified on the grounds of ensuring domestic security of supply and insulating consumers from international oil price shocks (Lott, 2017), the pricing mechanism for synthetic fuels in South Africa consistently fails in achieving either of these objectives. On the one hand, Sasol generates massive profits when oil prices are high. On the other hand, low oil prices make Sasol unprofitable; precedents suggest that this leads to increased government subsidies for Sasol (Rustomjee et al., 2007). Since the pricing mechanism is unable to insulate South African consumers from oil price shocks, the subsidies to Sasol are not achieving their objectives.

Subsidies to CTL Fuels

CTL fuels and Sasol have flourished in South Africa for a variety of reasons. Driven by sanctions against South Africa during the 1970s oil embargo, the apartheid regime created Sasol to produce CTL fuels domestically and, thereby, increase the fuel security of South Africa (Mondliwa & Roberts, 2019). Since then, government policies and regulatory mechanisms have cultivated Sasol and CTL fuels in South Africa. In explaining the conundrum of continued state support to Sasol, various authors have argued that the history and structure of the regulatory framework make it highly resistant to change (Marquard, 2006). Although a variety of policy issues, such as historical subsidies and supply agreements, have been addressed, they remain large sunk costs for South Africa, demonstrating the carbon lock-in propensity of fossil fuel subsidies (Burton et al., 2018). Thus, the cost of continuing synfuels operations being significantly lower than the cost of new energy investments contributes to the continued use of synfuels in South Africa.

Figure 1 captures some of the government support measures that have conferred financial benefits to Sasol since its inception.

Figure 1. Subsidies to Sasol



Support measure	Years	Type	Amount (in billion rands)	Source
Carbon Tax Exemption	2019	Non-internalized externalities	6.7- 6.9	IISD, 2020
Fuel pricing	2012 - 2019	Market Price Support	12.6	IISD,2020; Lott, 2017
Windfall profits of Equalisation Fund	1989 - 1995	Taiiff Protection	3.7	Rustomjee et al., 2017
Main Supply	1970 - 2003	Market Access guaranteed by the Government	NA	Sasol Limited, Eugen Limited, Petronas International Corporation Limited and Sasol Oil (Pty) Ltd, Eugen Ltd. (2006).

Currently, the regulatory mechanism for liquid fuels in South Africa confers benefits to Sasol in at least two visible ways. These are discussed below.

1. Market Price Support

MPS policies include government regulations that create artificial market prices for producers or consumers of a commodity. To estimate the value of MPS, the price paid to producers is compared to a reference price, which is a proxy for an unsubsidized market price. Any payment above the unsubsidized price is considered a subsidy. In the case of Sasol, the reference price could be based on Sasol's cost of production plus a reasonable margin. Sasol estimates that the breakeven cost of producing synfuels from coal is approximately $35/barrel (Sasol, 2019b). However, the data behind these figures are not publicly available and therefore cannot be critically reviewed. In the absence

of reliable data on Sasol's production costs, the author has estimated MPS based on the cost of procuring equivalent fuels via imports.

The Basic Fuel Price (BFP), the price paid to producers of petroleum and synthetic fuels, is determined by a pricing mechanism using import parity prices. It is important to note that using the import parity price as the benchmark for the domestic price leads to conservative (lower) subsidy estimates. Other countries with large refining industries like South Africa sometimes include the export parity price of refined products in their benchmarks, which are always lower than the import parity prices, as they do not include customs, insurance, and freight charges. Calculations from Lott (2017) and Rustomjee et al. (2007) show that the BFP is typically higher than the cost of imports, providing some degree of MPS to all liquid fuel producers in South Africa, including Sasol. This support represents transfers from consumers to the fossil fuels industry. Sasol's production cost is largely independent of international oil prices, which form the basis of the BFP. Although the pricing mechanism generates windfall profits for Sasol in times of high oil prices, it has also led to massive losses in times of low oil prices (Reuters, 2020).

This brief uses the following methodology by the Organisation for Economic Development and Co-operation (OECD Secretariat, 2010) and Lott (2017) for estimating MPS to Sasol. This method does not capture any subsidies that may result from the difference between the production costs of coal and oil-based fuels. Further work is needed to validate Sasol's production cost, which would shed further light on the extent to which coal-based fuels may be mispriced in South Africa.

Total MPS = (Domestic Price - Border Price) * Total Volume of Petrol

In this calculation,

- The *domestic price* refers to the BFP of petroleum (unleaded-95) in South Africa (Department of Energy, 2019). It is calculated monthly based on international oil prices in Singapore and the Mediterranean region and includes Free On Board value, freight and average freight rate assessment, insurance, ocean loss, demurrage, cargo dues, coastal storage, and stock financing costs.
- The *border price* is assumed to be the average cost, insurance, and freight (CIF) price of refineries in Singapore and the Mediterranean (Department of Energy, 2012; OECD Secretariat, 2010). The underlying rationale is that Sasol, despite being a domestic producer of synfuels, receives an import parity price based on oil. Since synfuels and oil-derived fuels are substitutes for each other, the CIF is useful in measuring the MPS to Sasol due to the BFP.
- As 1 m^3 of synfuel amounts to 70% diesel and 30% petrol, *the total volume* of refined products is multiplied by 30% to calculate the total volume of petroleum produced by Sasol.

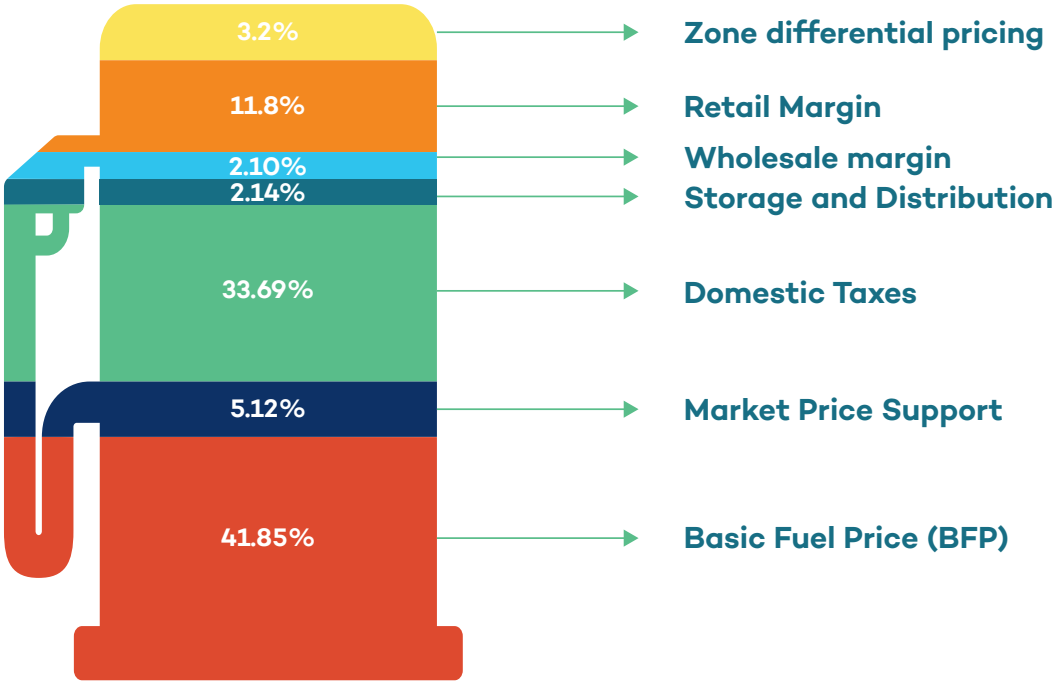
Based on this methodology, Table 1 outlines the MPS for Sasol from 2012 to 2019.

Table 1. MPS to Sasol

Year	MPS (billion rand)	MPS (million USD)
2019	1.55	107
2018	1.55	117
2017	1.60	115
2016	1.64	107
2015	1.63	123
2014	1.61	142
2013	1.57	116
2012	1.50	110
Total	**12.65**	**938**

In 2019, total revenues generated by Sasol in South Africa amounted to ZAR 95.22 billion (Sasol, 2019b). The 2019 MPS estimate of ZAR 1.55 billion implies that around 1.63% of the total revenues generated by Sasol were due to the MPS provided by the fuel pricing mechanism (OECD, 2016). Moreover, if the revenue from only energy (approximately ZAR 42.18 billion) is considered (Sasol also produces chemicals), then the percentage of MPS revenues is even higher—around 3.68% of the total revenues from energy operations (Sasol, 2019b). In other words, for every litre of synfuel a consumer buys at a fuel pump, approximately 5% of the cost provides MPS for Sasol.

Figure 2. MPS per litre of synthetic fuel



Source: PetroConnect, 2018.

2. Carbon Tax Exemption

Second, Sasol receives tax exemptions for meeting its obligations under the Carbon Tax Act 15 2019, with over 90% of the emissions not being taxed. The carbon tax, introduced in June 2019, is built on the polluter-pays principle and taxes emissions at ZAR 120 per tonne of carbon dioxide equivalent (CO_2e), reflecting the social and environmental cost of GHG emissions (Government of South Africa, 2019). However, the tax liability of major polluters is significantly reduced by the Carbon Budget of South Africa. While all major emitters receive a standard 60% exemption from the 2019 carbon tax, Sasol's exemptions are much higher (National Treasury, 2018).

The Carbon Tax Act 15 of 2019 permits Sasol to emit 302 Mt CO_2e between 2016 and 2020, implying that, on average, Sasol is not taxed for 60.4 Mt CO_2e emissions per year (Sasol 2019b). Since Sasol emitted 64.832 Mt CO_2e in South Africa in 2019, over 90% of its emissions will not be taxed; mathematically, this indirect subsidy of over ZAR 6.5 billion significantly reduces the incentives for Sasol to reduce its emissions. Lastly, Sasol made a commitment "to reduce by 2030 the absolute GHG emissions from our South African operations by at least 10%, of our 2017 baseline" (Sasol, 2019c). This would effectively mean almost 60 Mt CO_2e in emissions from Sasol in 2030. Therefore, even in the best-case scenario of the Paris Agreement, where South Africa achieves its goal of 398¬–614 Mt CO_2e per annum, Sasol would still be responsible for 9.6%–14.9% of the net emissions of South Africa. By Sasol's own admission, these emissions are more than two-and-a-half times higher than that of a crude oil refinery (Hallowes & Munnik, 2017). Emitting approximately 65 Mt CO_2e emissions, using 134.3 thousand m3 of water, consuming 402.6 million GJ of carbon-intensive energy, and generating 328 kt of hazardous waste, Sasol has significant environmental externalities that negatively impact the South African ecosystems in general and local communities' health in particular (Sasol, 2019b). Thus, from a climate perspective, CTL and synfuels are much less desirable than crude oil refineries.

Additionally, it is important to note that the estimate of the carbon tax exemption is conservative. Since Sasol does not meet environmental standards under South Africa's Technical Guidelines for Monitoring, Reporting and Verifying of GHGs 2017 (Sasol 2019a), it is expected to under-report its emissions until at least 2025. Moreover, the extent of public health externalities associated with Sasol's operations is evident in the recurring protests against air and water pollution in Sasolburg (Hallowes & Munnik, 2016). Therefore, in the presence of large exemptions and weak monitoring standards, ratcheting up the carbon tax will be an insufficient incentive to reform. The design of the carbon tax needs to be reformed to internalize the environmental externalities from major emitters, such as Sasol, and to ensure that no emissions are subsidized.

Conclusion

In 2019, the total value of MPS and carbon tax exemptions to Sasol was ZAR 8.05 billion (USD 490 million). The vast majority of these are from the carbon tax exemption, but MPS is responsible for around 5% of the cost of each litre of CTL gasoline sold. These support measures contribute to the high-profile role of coal in South Africa's transport sector. It is difficult to see compatibility between the continued consumption of coal-based fuels and South Africa's commitments under the Paris Agreement. Pricing policies are also subsidizing domestic petroleum refining at a cost to consumers. Subsidy reforms in the sector should focus on aligning energy policy with social and environmental objectives and promoting a shift to cleaner energy sources while employing "just transition" policies to ensure that no one is left behind.

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