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Review of economic regulation of liquid fuels and related products

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1 Introduction

Economic regulation has three main rationales. First, where there is entrenched market power – most obviously where there are natural monopolies – economic regulation may be adopted to constrain the exercise of this power. Second, regulation may be used to set criteria for access and to place requirements on participants through licencing. Third, regulation may be used to ensure socio-economic objectives are met such as universal service.

In South Africa, as in other countries, regulation is in the main about regulating the 'natural monopoly' parts of the economy that were state-owned and have been privatised. In some cases, the functions of economic regulation are undertaken by government departments. In the case of liquid fuel, the industry is subject to scale economies and there has been substantial state support and prior ownership of the largest producer, Sasol. These factors need to be considered alongside the pipeline network, owned by the transport utility, Transnet. The regulatory mandate and functions largely lie with the Department of Energy while regulation of piped gas and of petroleum pipelines is the mandate of NERSA.

The role of economic regulation can be understood in terms of prices and access (Viscusi et al., 2000). Prices are controlled or capped because otherwise they would be set at monopoly levels. Economic regulation can also require access to be provided to essential facilities or inputs which cannot be easily replicated and are controlled by the incumbent. This is, however, a relatively narrow and static delineation of the scope of regulation as it is focused on existing infrastructure and static considerations of efficiency. The case for economic regulation is also premised on the existence of significant market failure resulting from economies of scale and scope in production, from information imperfections in market transactions, from the existence of incomplete markets and externalities and from resulting income and wealth distribution effects (Jalilian et al., 2006). This implies that economic regulation is much more challenging in an industrialising economy where major investments are required yet institutional capacity is relatively weak. Influencing the structure of incentives, including prices, is also a critical part of industrial policy to alter the development path (see, for example, Amsden, 2003) and regulation is part of these choices.

Throughout its history the liquid fuels industry in South Africa has been granted a special status justified either through the nature of the retail petrol industry or through its strategic status post World War II. The special status led to an exemption from competition law until the early 2000s, a range of formal and informal institutions of cooperation between industry participants and with government, and extensive regulatory arrangements. The history of regulation in the refining and marketing of petrochemical products entrenched a long-standing culture of coordinated behaviour between oil companies. As a consequence, the liquid fuels value chain has been the subject of a series of competition cases relating to anti-competitive conduct not only in the liquid fuel markets but in related product markets.

In an effort to ensure security of supply, the apartheid government of the day initially allowed the refining industry to regulate the market and control price and entry and exit. Even when the regulatory role was institutionalised it was designed to incentivise the oil companies to

continue to produce in South Africa and to ensure the success of the synthetic fuel industry. Consequently, fuel regulation has often been in favour of the industry players (WTTT, 2007).

The relationship between regulation and economic growth has a number of dimensions (see, Mondliwa and Roberts, 2013). In the specific case of fuels we group these into considerations regarding fuel and issues related to linkages with chemicals and downstream products.

In each we critically assess the evolving regulatory regime against the different rationale for regulation, namely constraint of the exercise of market power, encouraging investment and regulating access to ensure social returns are taken into account and ensuring non-economic objectives are pursued, where appropriate.

With regard to fuel, the issues are essentially common to industries where there are large scale economies in upstream production as well as critical infrastructure required for transport, storage and distribution. Regulating the exercise of market power is particularly related to the inland position of Sasol, along with ensuring access to different levels of the supply chain, and ensuring investment in expanded capacity. There have been major changes in recent years in the participation of firms independent of the major oil companies in trading and retail of liquid fuels.

Under apartheid, security of supply had a particular meaning as sanctions posed a threat to relying on imports. Our review traces how regulation of fuel has changed since 1994 when this was no longer a concern but 'security of supply' continued to be one of the broad policy objectives. Local production and related chemicals has also been inextricably tied up with the role of Sasol, first as a state-owned company, and then privately owned but with a regulatory framework which protected its position through guaranteed sales and pricing, at least until the end of the Main Supply Agreement in December 2003.

A range of downstream organic chemicals are typically closely linked to refining activities. We examine these as value chains to understand the linkages between different levels and the role of different interests and institutions in the governance of the chains. We examine a case study of polymer chemicals to examine questions of the impact of fuel regulation on related products. A second case study of piped gas pricing assesses a recent regulatory framework for fuel sourced in the region (from Mozambique) in light of learnings from the experience of liquid fuels regulation.

This paper reviews the regulation of liquid fuels in South Africa over the past decade at two levels. We first give an overview of the industry and briefly describe the regulatory regime and how the regulatory functions have been carried out. Section 3 then considers the evolving policy and regulatory regime including the question of security of supply. Section 4 critically examines the role of regulation in terms of constraining the exertion of market power. Section 5 assesses the performance of regulators in the context of wider economic development challenges through two case studies, first, by examining the impact of regulation on linkages between fuel refining and chemicals production, and second, by assessing the regulation of gas prices in light of what can be learned from the review of regulation of liquid fuels. Section 6 concludes.

2 Overview of the Industry

2.1 Background

The South African fuel industry is comprised of a number of activities including extracting and importing of the inputs, crude oil, coal and gas. The upstream level of the market involves the refining of the inputs to produce liquid fuels and chemicals which are the by-products and co-products of the refining process. The upstream market is made up of the oil refineries (Enref, Chevref, Sapref and Natref) owned by the various oil companies and two synthetic fuel producers Sasol and Mossgas (table 1).

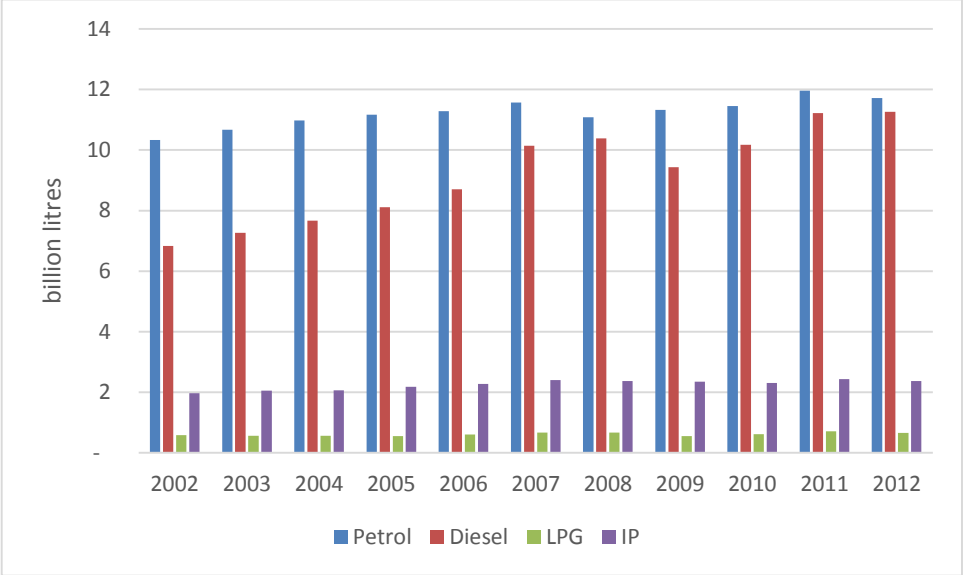
Table 1: Fuel Production in South Africa, ownership, capacity and location

Fuel production facility	Input	Owner	Capacity	Location
Sapref	crude	BP (50%)	90 000	Durban
		Shell (50%)	90 000	
Enref	crude	Engen	125 000	Durban
Natref	crude	Sasol Oil (64%)	69 120	Sasolburg
		Total SA (36%)	38 880	
Chevref	crude	Caltex	100 000	Cape Town
Synfuels	coal and gas	Sasol Oil	150 000	Secunda
Petro SA	Gas	State owned	45 000	Mossel Bay

Source: SAPIA

The ratio of petrol to diesel production in South Africa's refineries and the demand for petrol and diesel do not match. This resulted in surplus diesel in relation to the demand in the past. However, the increase diesel vehicles and the growing demand for liquid fuels has reduced this imbalance. The demand for diesel has increased over time from +/-7 billion litres in 2002 to +/-11 billion litres in 2013, while that of petrol has only increased less than 2 billion litres, (Figure 1).

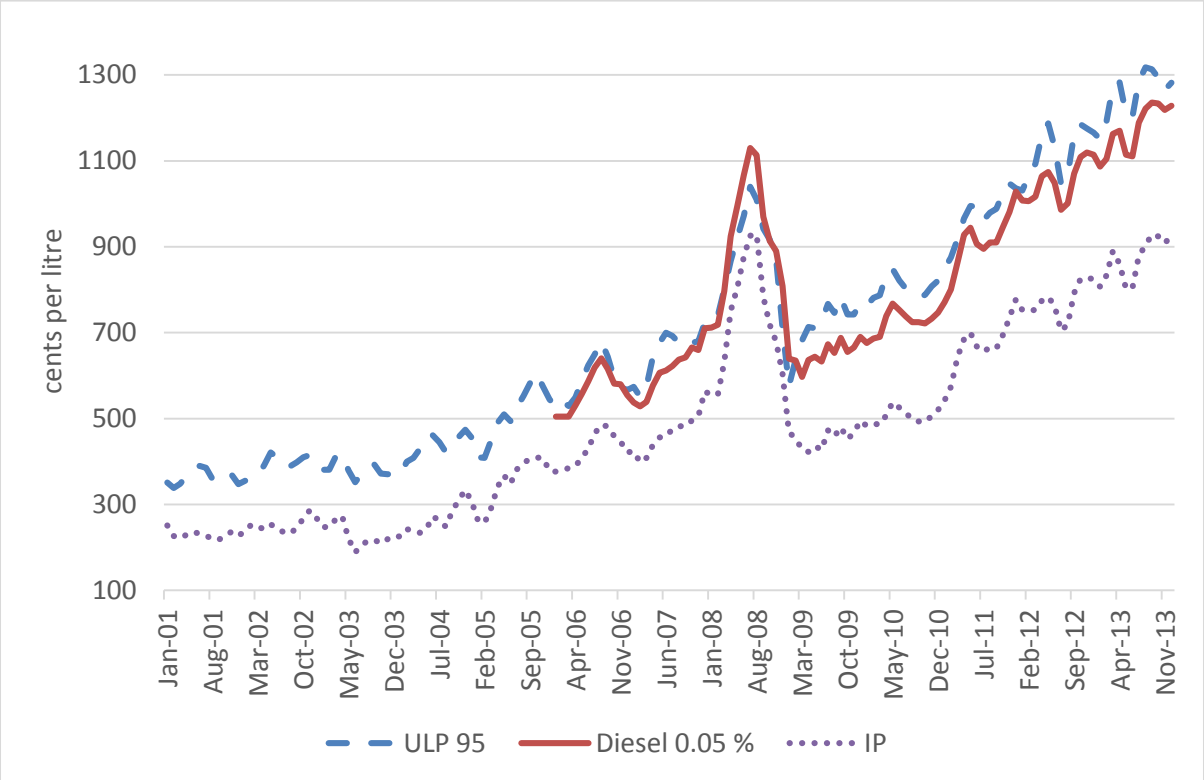
Figure 1: Liquid Fuel Consumption



Source: DOE

The petroleum products prices are all priced on an import parity basis, petrol is the most expensive of the fuels, over the period 2006 to 2013 it was 6% above the price of diesel (Figure 2).

Figure 2: Liquid fuel prices



Source: DOE

There are approximately 200 depots, 4 600 service stations and 100 000 direct consumers who are mostly farmers (SAPIA, 2014). The wholesaling of petroleum products is undertaken by BP Southern Africa, Chevron South Africa, Engen Petroleum, PetroSA, Sasol Oil, Shell South Africa, Total South Africa and independent wholesalers. These firms operate storage terminals and distribution facilities throughout the country.

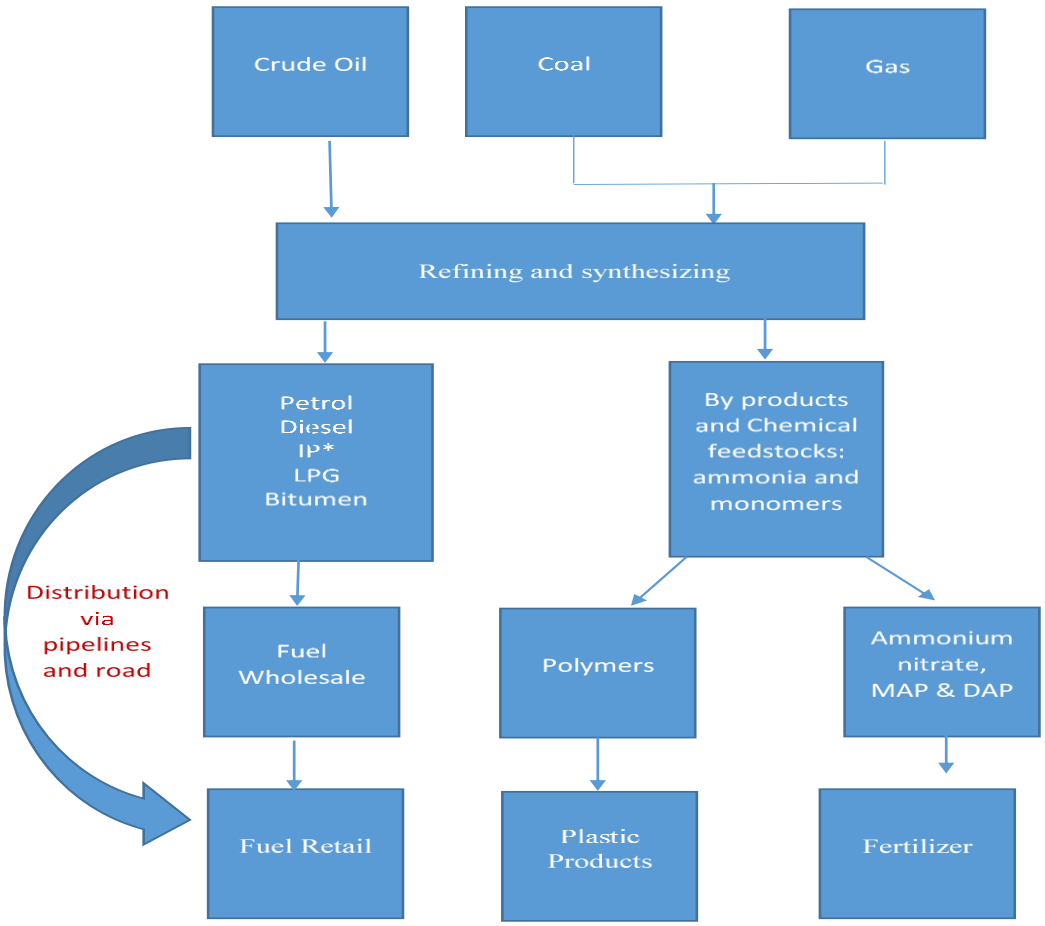
The end users of the liquid fuels can purchase product from a service stations in South Africa (SAPIA, 2014). The petroleum industry is currently licenced, in terms of the Petroleum Products Amendment Act of 1977, as amended in 2003. Government limits the number of licences allocated. Manufacturers and wholesalers are prohibited from holding a retail licence except for training purposes.

The manufacturing of liquid fuel produces high value by-products which can be separated, beneficiated and marketed. A description of the industry is incomplete if it does not give insight on the full value chains that flow from fuel production. Refineries are designed to optimise certain products and once a refinery is built it is not easy to reconfigure the production capacity. At the time that oil refineries were built in South Africa, Government prioritised the security of supply of fuel such that the oil refineries have been built to optimise the production of fuel and the by-products are further processed to be used as fuel components. Thus very little petrochemicals from the oil refineries are marketed as they are mainly used for internal consumption as fuel components.

The same cannot be said for the synthetic fuel producers, the nature of the production process lends itself to produce relatively high volumes of by-products and co-products. These co-products include ammonia (with various uses including the production of ammonium nitrate and ammonium phosphates used in the production of fertiliser), sulphur and phenolics produced during the gasification stage of production. The synthetic feedstocks can also be separated for the extraction of petrochemicals for polymer production. This is particularly attractive given the quality specification of fuel. Thus Sasol and PetroSA are the largest producers of the petrochemical feedstocks, however, PetroSA is not involved in the marketing of these products. For the first 20 years of the Synthol license from Sasol, PetroSA was prohibited from producing anything other than the liquid fuels from the technology (Das Nair *et al* 2012). These factors have created a dominant position for Sasol in the production and marketing of petrochemicals. The description of the full complement of products produced during fuel production is important as refinery economics and profitability is based on the full ‘soup’ of products produced by the refinery.

The production of fuels are a key part of different levels of processing and refining of basic feedstocks – generally oil and gas and in South Africa coal – to produce liquid fuels for motor vehicles along with a set of by-products and co-products which form the organic chemical building blocks for a range of products including polymer chemicals and fertilizers and explosives (Figure 3). Liquid transport fuels are themselves transported, distributed and marketed through different levels to a range of end-customers.

Figure 3: Fuel Value Chain



Before 1994 the regulatory regime had been biased towards producers in the form of the oil majors. As we explain below, a number of key policy and regulatory choices were made to support production by Sasol. After 1994, there was a critical re-evaluation which gave greater weight to customers of fuels and of by-products, however, the extent to which different interests are supported depends on their influence in the natural contestation that occurs. The power of different groups is derived from a number of sources but relevant to this context is their historically-rooted capacities to organise (Khan, 2010). We reflect on the major groupings at different levels of the value chain.

The upstream levels of the value chain (the refineries) are represented by the South African Petroleum Industry Association (SAPIA). The association represents the collective interests of its members which are BP Southern Africa (Pty) Ltd, Chevron South Africa (Pty) Ltd, Engen Petroleum Limited, PetroSA (Pty) Ltd, Sasol Limited, Shell SA (Pty) Ltd and Total South Africa (Pty) Ltd. Interestingly, Sasol only joined SAPIA in 2000 followed by PetroSA in 2002. SAPIA plays a strategic role in addressing a range of common issues relating to the refining, distribution and marketing of petroleum products, as well as promoting the industry's

environmental and socio-economic progress.[1] SAPIA fulfils this role by contributing to the development of regulation in certain areas of South African policy; proactively engaging with key stakeholders; sharing research information; providing expert advice; and communicating the industry's views to government, members of the public and media.

The association was founded in 1994 by the local businesses of the multinational oil majors. In 2012, the association opened its membership to licenced wholesalers or manufacturers (independent wholesalers). This was in fulfilment of the conditions of the exemption granted by the Competition Commission to allow SAPIA and its members to cooperate to ensure the continuity and stability of liquid fuels supply to various sectors and geographic locations of the South African economy (Competition Commission, 2011).

The licenced wholesalers that joined SAPIA are AEMCOR, Afric Oil (Pty) Ltd, Bahlaloga Technology's, Brent Oil (Pty) Ltd, Camel Fuels (Pty) Ltd, Easigas (Pty) Ltd, Elegant Fuels, Gulfstream (Pty) Ltd, Imbizo Petroleum Traders (Pty) Ltd, Khulaco (Pty) Ltd, KZN Oils (Pty) Ltd, Mabele Fuels (Pty) Ltd, Makwande Energy Trading (Pty) Ltd, Oryx Oil South Africa (Pty) Ltd, Royale Energy Ltd, Siyanda Petroleum and Totalgaz Southern Africa (Pty) Ltd (SAPIA, 2013). Prior to the exemption, SAPIA membership was restricted to refineries and opening it up has allowed for the licenced wholesalers to benefit from the exempted agreements and practices (Competition Commission, 2011). Licencees have confirmed that participation in the association has contributed to levelling the playing field in the petroleum and refinery industry.[2]

Independent wholesalers are also represented by the Liquid Fuels Wholesalers Association (LFWA) with its members being Seven Bridges Trading 23 (Pty) Ltd, Gulfstream Energy (Pty) Ltd, Tipublox Petroleum, Freestate Petroleum Distributors (Pty) Ltd, Auto Commodities (Pty) LTD, Intertrans Oil SA (Pty) Ltd, Oilco Group, PMB Petroleum Services (Pty) Ltd, Verulam Fuel Distributors CC, All Fuels and B F Distributors Group. LFWA was formed in 2011 to represent independent wholesalers' interests and ensure that consultation takes place and that the regulator also addresses issues in diesel and paraffin.[3]

The downstream industry is also represented by two associations the Fuels was formed in 1998 and to date has a membership over 1 700 entrepreneurs engaged in activities relating to the retailing of liquid petroleum and associated activities.[4] SAPRA represents and promotes the interests of over 1000 petroleum retailers.[5]

Though the regulator is tasked with balancing the interests of the producers and the consumers there is also a need to balance the interests of the different role players. All the associations are allowed to make submissions to the regulator when there are changes on the table. The ultimate consumer of the products is not organised and it is up to the regulator to ensure that its interests are taken into consideration.

Other key role players in the industry are the different regulators and infrastructure owners. The Department of Energy (DOE) oversees all policy directly relating the liquid fuels industry

[1] http://www.sapia.co.za/
[2] Interview an independent wholesaler.
[3] http://www.lfwa.co.za/
[4] http://www.fuelretailers.co.za/index.php#
[5] http://www.sapra.co.za/

and regulates price and access of petroleum products. The National Energy Regulator of South Africa (NERSA) regulates access and tariffs to liquid fuels infrastructure including pipelines and storage facilities. Transnet owns petroleum pipelines and storage facilities.

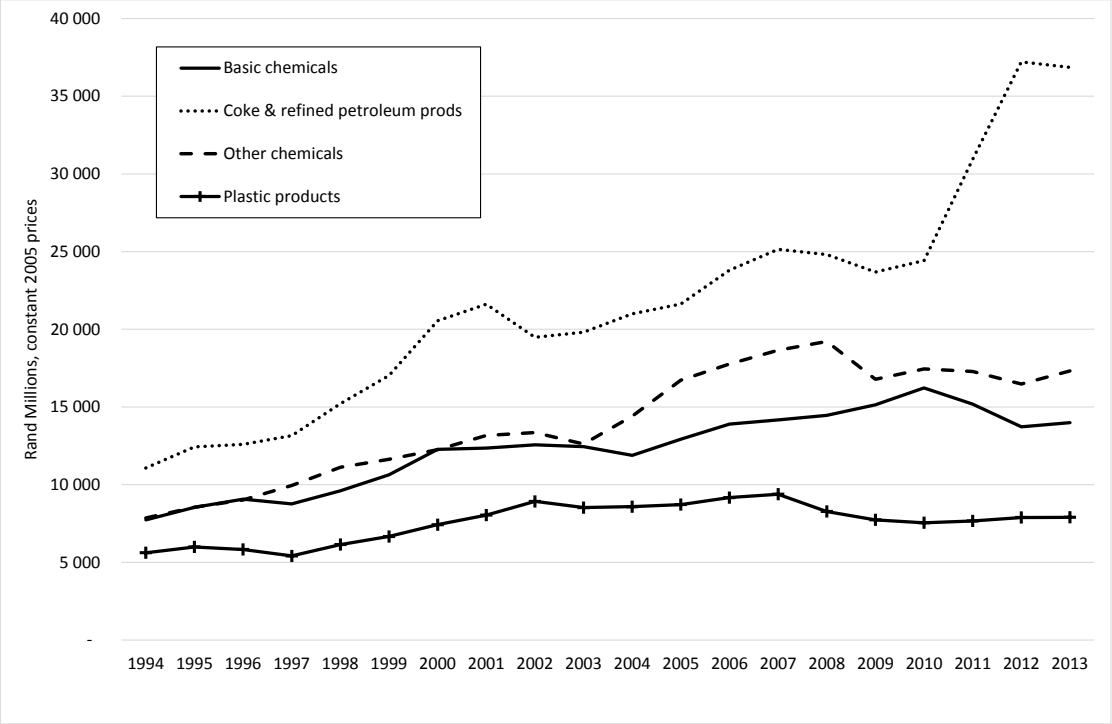
2.2 Sector Performance

The energy industry contributes to economic growth as an important sector of the economy that creates jobs and value by extracting, transforming and distributing energy goods and services throughout the economy. Energy underpins the economy in being essential for transport of goods, people and for productive activity. In 2012, the petroleum industry contributed 6.48% of national GDP (SAPIA). The liquid fuels and related products form part of a complex and diversified sector with the industries in this sector highly inter-linked. Due to the focus by the apartheid government the upstream market is well developed but the downstream is relatively underdeveloped. The sectors forms the largest broad manufacturing grouping in terms of value-added when we take the coke & refined petroleum products, basic chemicals, other chemicals and manmade fibres and the plastics industries together. The grouping is the third largest employer in manufacturing. It is relatively capital-intensive upstream (in refining and basic chemicals) and more labour-intensive downstream (in the manufacture of plastics products).

The South African fuel industry certainly has a role in the economic development of South Africa due to the number of Small and Medium Sized Enterprises (SMME) involved as well as the number of people employed both directly and indirectly in the industry. The fuel industry was estimated to be responsible for 100 000 direct and indirect jobs, with refining accounting for just 13.8% of this (SAPIA, 2012). The fuel retailing level is much more labour intensive, employing an estimated 70 000 people (FRA, 2013).

The average growth in value-added at the upstream level of coke & refineries has been strong at 6.5% per annum in the period 1994 -2013. This compares with poorer performance for downstream activities. Over the same period plastic products average annual growth was just 1.8%, while basic chemicals and other chemicals grew at 3.2% and 4.2% respectively (Figure 4). From 2006-2013 the performance of non-refinery activities was even poorer. The average growth rates for plastic products was -2.1%, 0.1% for basic chemicals and 0.4% for other chemicals. This performance is concerning as the downstream industries should be growing more rapidly than upstream sectors in a diversified industrialising economy. This raises questions about the input costs charged to downstream industries.

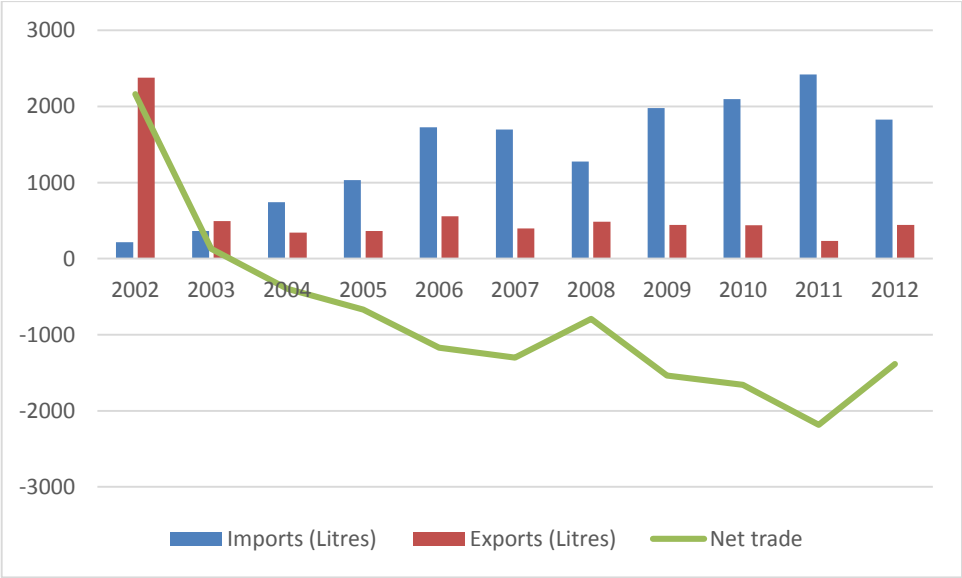
Figure 4: Output Performance (value added, constant 2005 prices).



Source: Quantec

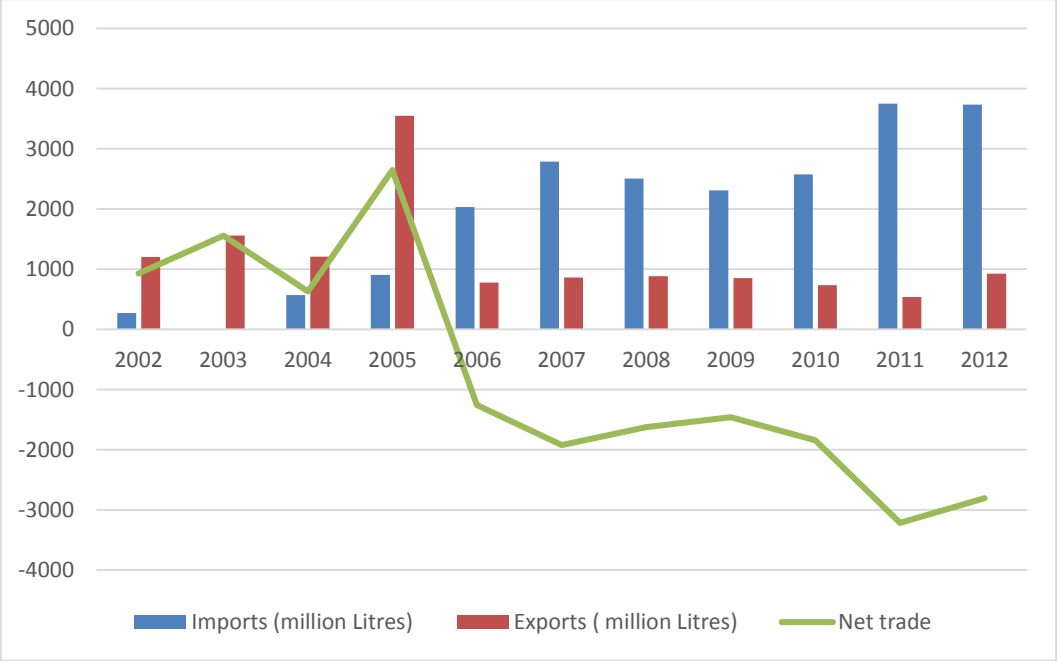
Despite the growth in refining value-added South Africa has moved from being a net exporter of liquid fuels to being a net importer during the past decade. Imports outstripped exports of petrol from 2003 onwards (Figure 5), while in diesel the trade surplus turned to a deficit in 2006 (Figure 6).

Figure 5: Net Trade for Petrol: demand outstripping supply for fuel



Source: DOE

Figure 6: Net Trade for Diesel: demand outstripping supply for fuel



Source: DOE

Growth in value-added reflects returns to capital and labour rather than physical volumes. Data on listed firms indicate that mark-ups are very high in petroleum and basic chemical products. According to Aghion et al. (2008) the average profit (net income to asset ratio) for chemicals firms in South Africa is more than 2.5 times the world average, while estimates of price mark-ups over marginal cost for the period 1971-2004 found that coke & petroleum products had the second highest mark-ups of South African manufacturing sectors (at 330% mark-up). The Windfall Tax Task Team (WTTT) study also found that there very high margins for synfuels producers given the prevailing crude oil price. Indeed, as we discuss below, it appears as if oil companies have been able to charge above actual import parity prices.[6]

[6] Note that while the oil companies charge IPP related prices under the regulatory framework, PetroSA has been obliged to sell to the majors at export parity prices.

3 Policy and regulatory framework

3.1 Regulation of Liquid Fuels

The DOE oversees the development of energy policy and implementation thereof. The department's website describes its function as ensuring exploration, development, processing, utilisation and management of South Africa's mineral and energy resources (DOE, 2014). Energy policy and its subsequent legislative and regulatory frameworks are the foundation upon which the regulator and investors make decisions and consumers make choices about which energy solution to use (Beare, 2013). The 1998 national White Paper on Energy Policy is the most comprehensive energy policy document to date and is the primary reference for all subsequent legislation. One of the medium term policy priorities for the energy sector identified is to stimulate economic growth. With regards to liquid fuels the white paper calls for the re-regulation of the liquid fuels industry to achieve higher levels of competition and unrestricted market access. It also notes the need to strike an equitable balance between the interests of industry participants and consumers. The Petroleum Products Act, the main legislation governing the regulation of petroleum products identifies its objectives as:

- promoting an efficient manufacturing , wholesaling and retailing petroleum industry;
- facilitating an environment conducive to efficient and commercially justifiable investment;
- the creation of employment opportunities and the development of small business in the petroleum sector;
- ensuring country wide availability of petroleum products at competitive prices; and
- promoting access to affordable petroleum products by low income consumers for household use.

National policies that are relevant to the fuel and related industries include the National Development Plan (NDP) and the Industrial Policy Action Plan (IPAP). The NDP directly addresses fuel and gas, emphasising the need for adequate supply security of energy such that economic activity, transport, and welfare are not disrupted. With regards to liquid fuels the NDP identifies declining gas stocks for the gas to liquids production at Mossgas and increasing dependence on imported product due to insufficient domestic production capacity as the main challenges. It calls for the upgrading of fuel refineries to ensure compliance with new fuel quality standards (clean fuels 2) and closer management of strategic fuel stocks to ensure security of supply. Regarding gas, it calls for a conducive environment to exploratory drilling and fast tracking of development of resources in the event of success. There is also an emphasis on the incorporation of a greater share of gas in the energy mix, both through importing liquefied natural gas and if reserves prove commercial, using shale gas.

IPAP notes a concern regarding mineral feedstocks supplied into the South African economy at monopoly prices and subsequently severely curtailing downstream job creation. Polymers is one such example. In recognition of the limitations of competition policy in addressing such issues IPAP 5 further calls for the identification of concrete complementary measures to

competition enforcement, as part of a broader policy toolkit that could be deployed to address anti-competitive behaviour. The 2014 version, IPAP 6, proposes the regulation of polymer chemicals as alternative solution to the anti-competitive concerns.

Aspects of the South African petroleum value chain are regulated largely under the mandate of the Department of Energy (DOE) and administered either directly or by the National Energy Regulator of South Africa (NERSA). The DOE is responsible for the setting of various price levels for petroleum products and licensing activities throughout the downstream liquid fuels value chain in terms of the Petroleum Products Act, No 120 of 1977, as amended. NERSA sets tariffs for the infrastructure linked to the value chain e.g. petroleum pipelines and storage facilities.

The upstream inputs in the production of synthetic fuels, coal and natural gas, are regulated by the Department of Mineral Resources (DMR) and NERSA respectively. Coal is regulated in terms of the Mineral Resources and Petroleum Development Act (No. 28 of 2002, as amended) and natural gas is regulated in terms of the Gas Act (No. 48 of 2001).

There are five main features to downstream liquid fuels regulation in South Africa namely licensing, export/import control, fuel quality standards, infrastructure tariff setting and price administration. Each of these features is important in investment decision making and the ultimate price that the consumer pays. Incentivising investment and ensuring internationally competitive pricing are two objectives that the regulators need to continuously be balancing. We briefly describe the regulatory activities of each feature.

Licencing of petroleum activities

Manufacturing, wholesaling, and retailing petroleum activities are licenced activities as per the Petroleum Products Act of 1977 as amended in 2003. Licencing is designed to give effect to various policy objectives such as separating the retail and marketing of petroleum products where firms are prevented from holding licences in more than one level of the value chain. In addition to the vertical separation aspect, licencing is also designed to give effect to other policy objectives such as promoting employment by prohibiting self-service and enforcing fuel specifications. To date there is still vertical integration where oil majors manufacturing petrol also own retail outlets.

Import/Export control

Importation of petroleum products is regulated in terms of the International Trade Administration Act, 2002 (Act No 71 of 2002), administered by ITAC on recommendation by the DOE. Permits for the importation of refined products are granted only in the event that local refiners cannot meet demand. Similarly exportation permits are granted once the local demand has been met. Limitation of importation of finished petroleum products has been justified on the basis of the need to support local refining so as to promote security of supply, protect local jobs and minimise the impact of oil on the trade balance (Gumede, 2008).

The import and export of petroleum products has become an important aspect of the liquid fuels regulatory environment, more especially with the advent of a local refining capacity deficit

resulting in increased refined products and components imports (Beare, 2013). The need for imported products creates an opportunity for involvement of BBBEE companies, as required by the liquid fuels charter but will also highlight issues about access to port and transport infrastructure by independents.

The restrictions on imports of petroleum have ensured the adherence to the status quo in the liquid fuels industry by creating a barrier to entry for potential marketing of petroleum products. The windfall task team had recommended that the quantitative import controls must be removed and replaced with a policy approach that favours imports of biofuels rather than petroleum fuels. The white paper also envisaged the removal of import/export controls but this is yet to happen.

Fuels quality standards

The DOE also regulates the quality of the fuel that is produced and imported into the country by limiting the amount of sulphur and lead based additives used in fuel production. The local fuel requirements or Clean Fuels 1 is equivalent to the Euro II and has been enforced since 2008. A further improvement to clean fuels 2 (equivalent to the Euro V) specifications were gazetted in 2012 with the initial expected compliance date being 1 July 2017 but this date is being renegotiated. The improvement in the fuel specifications requires investment by the oil companies to reconfigure refineries and investments have been delayed due to concerns about the cost recovery mechanisms that will be adopted by the regulator.

SAPIA has highlighted that the main issue for the market is regulatory uncertainty. There are a number of things on the table and no clarity on what will be implemented and when. Also there is no certainty that the industry will be able to recover costs to comply and this has led to the delay of clean fuels 2 investments by the industry. Though the DOE admits that there are issues where there is less certainty they note that issues are usually related to time delays due to the complexity of issues. There is also a tendency of early announcement of work to be done by the minister, and sometimes the minister will commit the department to do things that are not in the business plan for the year and then this raises budget issues.

Infrastructure tariff setting

The inland market represents about 48% of total South African demand and thus access to the market is essential for refiners and importers of petroleum products (Beare, 2013). Refiners and importers would have to secure capacity in the port to discharge fuel for injection into the pipeline to the inland region and storage in the inland region before distribution to customers. Petroleum pipelines are regulated by NERSA in terms of petroleum pipelines regulations and empowered by the Petroleum Pipelines Act (No. 60 of 2003). NERSA issues licenses, sets tariffs for petroleum pipelines and approves the tariffs for storage and loading and off-loading infrastructure. Third party access is assured for uncommitted capacity, however, no mandatory access is assured in term of the Act.

Interviewed independent wholesalers of fuel have identified access to infrastructure as one of the barriers to expansion. Notionally these wholesalers can import fuel at better prices than sourcing locally, however, the product would need to be birthed at the port and put into storage before injecting into the pipeline. Currently most of the capacity for this logistics infrastructure

to import is tied up by the oil majors. One independent wholesaler, secured an importing licence in 2009 but has not actually been able to import. Another wholesaler secured a licence in about 2008 and has not been able to import directly but has been able to purchase product from one of the Oil Majors and draw from the pipelines to service its customers.

Fuel price administration

Various fuel product prices are regulated either at the wholesale or retail level while others such as fuel are regulated at both levels. The DOE sets prices for liquid fuel products including, the pump price of petrol by location, retail price of illuminating paraffin, wholesale fuels, and liquefied petroleum gas refinery gate price. The petrol pump price is made up of various components and DOE controls most of these components including transport costs, retail and wholesale margins, the petroleum pipelines tariffs are controlled by the National Energy Regulator of South Africa (NERSA) and the fuel levy is determined by National Treasury.

All liquid fuels are regulated at refinery gate except for HFO, petrol, diesel and illuminating paraffin which are regulated at the wholesale level, and petrol is also regulated at the retail level. Maximum prices of liquid petroleum gas have been regulated from 2009. The structure of the petrol price has remained essentially the same since the 1950s consisting of the basic fuel cost (cost of importing fuel), transport component (cost of transporting fuel to a specific location in SA); Tax component (various government levies); a wholesale margin (MPAR)-oil company margin; a retail margin – dealer margin and other components that have varied over time. The biggest component of the petrol pump price is BFP (Table 2).

Table 2: Petrol Pump Price components

Component	Contribution (c/l)	%
BFP	675.85	57%
Government duties and levies	289.65	25%
Zone differential	26.8	2%
Industry margin	58	5%
Service differential	25	2%
Dealer margin	99.2	8%
Incremental inland transport recovery levy	3	0.25%

Source: DOE (2008 data)

The liquid fuels market is also influenced by the control of exports and imports and non-price regulation of trade. Most of the components are regulated by the DOE, however, there are some components that are calculated by NERSA and National Treasury.

3.2 History of regulation in the South African market

The history of the petroleum industry is important in understanding the rationale for certain decisions particularly as there are components of the current regulatory structure that are inherited from the apartheid government. Prior to the development of the indigenous refining industry regulation of the retail fuel sector was carried out by the industry, which controlled the price as well as entry into the market. The state took over the price-setting process for petrol sales as well as retail and wholesale margins in 1946. Between 1946 and 1970 the state began development of the indigenous fuel industry, regulated refinery gate, wholesale and retail prices and restricted imports (Price Control Act 1960) (Marquard, 2006). The development of the synthetic fuel industry in the 1950s and the beginning of the oil embargo in 1970 required modifications to regulation systems to accommodate the State's oil security strategy (Petroleum Act 1977). In 1954 government secured the conclusion of agreements known as the Main Supply Agreements or the MSA between Sasol and the other oil companies. These agreements effectively constituted a government-brokered and sanctioned form of private regulation, obliging the oil companies to service their marketing requirements in the inland region by purchasing all of Sasol's production volumes pro-rata to their market shares.[7]

The price of these volumes was based on the "in-bond landed cost" (IBLC), calculated on the basis of an import parity price for fuel products. The essence of the MSA was that the oil companies would purchase Sasol's production of petroleum products up to certain maximum volumes from defined sources of supply, and Sasol would not market petroleum products save for certain exceptions. The petroleum industry was also exempted from the competition law between 1988 and 2001.

It is also noteworthy that the inland fuel production is not subject to supply competition as a result of infrastructure constraints this concern was raised as far back as 2007 (WTTT, 2007). And perhaps more concerning is that the historic and current South African price regulation ignores the different configurations and cost structures of the players in the liquid fuels industry and instead strives to use an international benchmark price.

There have been a number of reviews of liquid fuels regulation including WTTT (2007), Moerane Investigation Team (2006), Liquid Fuels Industry Task Team (1994) and though these reviews have had different focuses, one can observe common threads regarding the criticism of liquid fuels regulation in South Africa, the price regulation. In the discussion of the economic regulation of liquid fuels we will also discuss the criticism by the different reviews and the implementation of the recommendations by the DOE.

Since 1994 the DOE and its predecessor have made changes to the regulatory framework of liquid fuels in an attempt to arrive at a more competitive price. As discussed, the significant changes were seen in 1994, 2000, 2003 and 2011.

[7] Competition Commission Press release 12 October 2012

3.3 Progress with Liberalisation

The 1998 Energy White Paper's short and medium term objective is to re-regulate the liquid fuels industry to achieve higher levels of competition and unrestricted market access and the long term objective is to deregulate (removing price and trade controls) the fuel industry. The white paper outlines milestones in three phases that must be reached before deregulation of the industry. 16 years later the milestones in phase one have only been partially achieved.

Under phase 1 the milestones are:

- mutually acceptable arrangements between producers & marketers of fuel on the up-liftment & marketing of synfuels;
- The introduction of suitable transitional arrangements within the Service Station Rationalisation Plan;
- capacity to license and/or regulate oil and liquid fuel pipelines storage facilities if this is found necessary;
- equitable participation of small businesses in the industry;
- equip regulator with capacity required to adequately monitor possible post deregulation distortions and address these;
- sustainable presence, ownership/control by HDSA's of 25%;
- arrangements to address any labour related consequences of deregulation.

The first three milestones have largely been achieved. There are arrangements in place for the up-liftment of PetroSA's volumes. The Rationalisation Plan (RATPLAN) was implemented, subsequently phased out and replaced by licencing. There are some challenges relating to the licencing and these are discussed below. Equitable participation of small businesses and equipping the regulator to monitor prices post deregulation have not entirely been achieved. There have been strides made in introducing participation by small businesses but there is still some work required to ensure that the environment is conducive to the sustainability of these businesses in the industry. The licencing regime has created opportunities for participation by independent wholesalers while the move to the Regulatory Accounting System (RAS) model was designed to ensure that independent participants in marketing and distribution get their fair share of the margin. These have not been without challenges and these challenges are discussed later in the report.

The last two milestones have not been achieved. The liquid fuels charter was promulgated in 2000 to empower Historically Disadvantaged South Africans (HDSA) within the petroleum and liquid fuels industry. The audit conducted in 2010 found that technical skills transfer to HDSA's at all levels suffered a setback and that there were legislation enforcement issues that need to be attended to by the DoE to ensure opening up of the opportunities for particularly black entrepreneurs (Moloto Solutions, 2011). The last milestone will only be relevant once the industry has been deregulated.

The Phase 2 milestone is the simultaneous removal of retail price regulation, import control and government support for the RATPLAN. As some of the phase one milestones have not been met the regulator has not been in a position to remove the price regulation. The RATPLAN has been phased out but import controls are still in place albeit with changes to allow licenced wholesalers to import refined petroleum products into the country.

The Phase 3 milestone is for government to monitor and evaluate possible problems arising from the introduction of deregulation and to take corrective action. To achieve this milestone it would first be required for the industry to be deregulated. What actually happened is that more products are being regulated, for instance, the department started regulating the maximum price of liquid petroleum gas. The LFWA has also proposed that other petroleum products must receive the same level of attention from the regulator as petrol, which is regulated at every level of the value chain.

The energy white paper's milestones represent the necessary steps to balance the interests of the liquid fuels industry participants. The importance of these milestones is confirmed by recommendations made by previous reviews of fuels industry which, for example, reinforced the need to open up the industry to allow import, trading and supply by independent firms, along with more effective regulation of bottleneck pipeline and storage facilities and of synfuels producers (see for example WTTT, 2007). However, progress has been very slow.

3.4 Security of supply and regulatory challenges

Liquid fuel has been viewed as a strategic necessity in South Africa given its importance to the economy. However, while obviously a critical product for economic activity, it is also readily transported internationally. Under apartheid there was a rationale for supporting local production to guard against the possible effect of sanctions. However, absent this concern ensuring supply means being able to make sure the transport, storage and distribution functions are effective to ensure product can be marketed to customers regardless of whether it is locally made or imported. In addition, if the feedstock (crude oil) is still imported then in effect we are only considering a foreign exchange effect in the difference between importing crude oil and importing refined product.

It is thus important to ask what security of supply actually means, and how it relates to investment in refining capacity and to opening up participation in importing and trading of liquid fuels.

Security of supply can be understood in non-economic terms, as a strategic policy choice. It can also be understood in terms of the difference between the private returns (that is, the returns to the individual producer) and the wider return to the economy from a supply disruption. The producer simply loses sales, while the knock-on effect which is external to the producer is much greater because of the indispensable nature of fuel to much of economic activity. However, it bears emphasising that this is not about refining capacity but about adequate sourcing of refined product and its distribution. Even if the country is self-sufficient in the capacity to make refined products, this capacity will be shut-down for maintenance and when there are faults.

Investment in storage and transport infrastructure, from bulk storage tanks at the coast to pipelines and a network of storage facilities stretching inland is what is critical for *supply*. This needs to have the capacity to meet peak demand and for investments to be planned and implemented in advance of the demand growth in the country. One approach is central coordination together with restricted licencing of access to ensure that those using it comply with the requirements of meeting demand. Another approach is to allow for rivalry between competing firms to anticipate demand, market products and craft service offerings for different customer requirements. This can mean duplication, which will also mean greater competition which typically is more responsive to consumers' needs.

A distinction can be drawn between critical infrastructure, such as long distance pipelines requiring substantial capital expenditure and advanced planning, and local depots and storage facilities which can be erected easily by different suppliers. For the first group of infrastructure there is a stronger argument for coordination and regulation, although there is still room for competition between pipelines as in the USA. For the second, access by a wider set of possible wholesale and retailers will likely increase the effectiveness of the network by bringing in traders and retailers who are closer to customers. This relies on ensuring access to the critical infrastructure on a relatively open basis and not restricting it to the select 'insiders' who have adopted the mantle of custodians of fuel supply.

The democratic state also faces the challenge of increasing economic participation, while not being subject to the same constraints regarding international supply as the apartheid state (of sanctions). In recent years there has been a growth of new suppliers and retailers. These include suppliers linked to agricultural co-operatives and farming requisites, such as Obaro, as well as some engaged in wider wholesale and retail activities, led by Brent Oil which has a national network of depots and fleet of tankers oriented to the commercial market.[8] These smaller players have contributed to a substantially 'thicker' distribution infrastructure and different service offerings crafted to customer groupings. These developments were facilitated by the Petroleum Products Amendment Act no 58 of 2003 promulgated in 2006 which provided for the licensing of persons involved in the manufacturing or sale of petroleum products to promote transformation of the South African liquid fuels industry. This opened up space for independent wholesalers.[9]

Until the very recent changes, however, concerns around supply continued to be leveraged to protect the positions of the large oil company insiders. This has the further unintended consequence of maintaining very large interest groups with a stake in the status quo. Conversely, more diversified participation in supply implies less dependence on particular producers.

The evolving contestation and debates around new investment in refining have played out against the changing influence of different ideas. The belief in the importance of self-sufficiency in refined fuel has declined and is now more about the straightforward economic arguments. In these terms, the proposed new Sasol synfuels refinery (Mafutha) has turned

[8] See www.brentoil.co.za and www.obaro.co.za .
[9] The Liquid Fuels Wholesalers Association also claims that the oil companies wanted to move out of less attractive business such as some segments of commercial sales and retail in rural areas which then created a market for independent wholesalers. See http://www.lfwa.co.za/history.php

out to be apparently much less attractive given the capital cost and considerations such as the likely CO_2 emissions and the cost thereof. The economic benefits to fuel consumers would depend on whether the investment meant more competitive pricing – at best a moot point as it would simply add to the market share of Sasol, already dominant in the inland market (as determined by the Competition Tribunal in their ruling on the proposed Sasol-Engen (uHambo) merger). The consideration of the proposed Umthombo refinery needs to be done in similar terms.

With regard to Mafutha, the National Treasury noted in rejecting the tighter regulation of Sasol's inland market power proposed by the WTTT that it welcomed Sasol's commitment to the feasibility of investing in Project Mafutha and possible gas to liquids refining investments and that it would 'hold Sasol to its commitment to significantly expand its synthetic fuel production capacity in support of national interest in terms of fuel security and macroeconomic stability' (National Treasury, 2007). In the same response National Treasury also indicated that in 1998 cabinet had 'effectively' released Sasol from the obligation to repay the subsidies it had received, provided Sasol continued to develop the petrochemicals sector. The fact that major investments in expanded refining capacity have not been made by Sasol raises the question about the appropriate response in terms of regulation of market power, to which we now turn.

4 Price regulation and market power

We examine the evolving framework of price regulation in terms of: how import parity benchmarks have been adopted and implemented; the particular question of the inland market where Sasol is dominant and a low cost producer; and, the influence that information exchange has had over competition.

The regulatory framework regulates prices at different levels from the refinery gate to wholesale and retail. This might suggest a substantial concern with the exertion of market power but the regulated prices are based on import parity benchmarks, including all transport and related costs, which effectively mean the prices are effectively set at the highest level that could be charged in the market. Indeed, our review of the changes over time indicates that the prices set through regulation have been higher than actual import prices. In addition, the prices posted under the regulatory framework also appear to have dampened competition, at least when combined with the information exchanged between firms on sales quantities.

4.1 Calculating imputed import parity prices

The aim of the initial import parity pricing system from the 1950s was to encourage import substitution. The oil companies wanted a guaranteed return given the small size of the economy. The mechanism of import parity implies using a price in a benchmark source country or countries and adding in all the costs associated with importing and efficiently delivering that product to a particular location in South Africa to arrive at the regulated price. The economic rationale is that a seller may be expected to sell his/her product at or below the price at which the next nearest producer could deliver the product to that point of demand. If the country as

a whole is short of refined product then imports would be the marginal source of supply. However, the import parity price set through regulation is an imputed price and does not necessarily reflect the price at which imports could actually be sourced.

This import parity price was calculated as an In-Bond Landed Cost (IBLC) until 2003 when there was a shift to the Basic Fuel Price calculation. The IBLC took an international product price calculated as an average of a basket of FOB posted prices from four international refineries, and adding hypothetical freight, insurance, leakage and landing charges for a South African port. IBLC was the refinery gate price for coastal refineries, a premium was added in the form of hypothetical transport from the coast for inland refineries. The rationale for IBLC was that the refineries should get the same prices for locally produced fuel as those they would have received if they imported fuel into the country (Lloyd, 2001).

It is now evident that there were various ways in which the IBLC calculation inflated prices above a true import price, directly inflating the margins of the oil refiners.

From 1973 the international price was based on the posted prices of three refineries in Singapore and one in Bahrain, which were owned and operated by the big four oil companies operating in South Africa (Marquard, 2006). This inflated prices in three ways.

First, Singapore was an inappropriate benchmark as it was one of the most expensive refining areas from which to buy fuel and thus not the next best alternative source for the local market. Also, Singapore markets were oriented more to diesel than petrol thus the petrol market was less developed and consequently more expensive. The dynamics are different in the South African market, where petrol is the most important petroleum product. Second, as Singapore is further from Durban than the Arab Gulf and Mediterranean Sea this increased the notional shipping cost. Third, the use of posted prices as opposed to spot prices meant higher prices. At least from 1970 onwards spot prices were the international standard basis for exports while South Africa continued to use posted prices. This was a substantial mark-up as posted prices were on average 10c/l higher than spot prices in 1997 (Marquard, 2006).

On the recommendation of the Liquid Fuels Industry Task Force (LFITF) in 1994, the reference refineries were changed and a Platts spot assessment was added as a fifth element (meaning one out of the five price used was a spot price).

In 2003 there was a move from the IBLC to the Basic Fuel Price (BFP) (currently in use). A comparison between the IBLC and BFP over the period 1996 to September 2002 revealed that on average the BFP was lower than the IBLC by four cents/litre for petrol, seven cents/litre for diesel, and 10 cents/litre for paraffin (SAPIA, 2012). The DME reported that every 1 c/litre saving in petrol and diesel was equivalent to about R150 million per year in South Africa at the time (Parliamentary Monitoring Group, 2003).

The BFP is calculated as the average of daily spot prices from Singapore, Mediterranean (Italy) and the Arab Gulf to arrive at a monthly price for each product category. For petrol it is calculated on 50% Mediterranean (Italy) and 50% Singapore, while diesel is 50% Mediterranean and 50% Arab Gulf. Freight, insurance and wharfage are added to arrive at the IPP. These components are the same as those used in IBLC with the addition of the coastal storage cost and stock finance cost. The additions were at the request of the oil companies

and were an attempt to measure the true cost of importing petroleum products (Marquard, 2006).

The way in which the sea freight component has been calculated has also inflated prices. When the formula was devised tanker sizes were small, however, the tanker size used in the formula remained constant even though the average tanker size for transporting fuels had grown considerably larger and reduced the actual per unit cost of transporting fuel considerably. The LFITF review led to freight charges being reduced from the levels that were in the IBLC.

The current formula for calculating BFP can be expressed as:

- average CIF price = FOB Spot prices & Spot premiums, plus freight, including demurrage allowances and insurance)
- plus Ocean Loss Allowance
- plus Cargo Dues (Landed costs for imports at South African ports), plus Coastal Storage Cost, plus Stock Financing Cost.

The basic pricing formula in its current form has also been subject to various criticisms. The issues relate to whether BFP actually reflects the true Import Parity Price that it seeks to approximate (WTTT, 2007) and whether the BFP import parity pricing system is appropriate in the first place (Moerane *et al*, 2006). These issues are also recognised by the DoE, who have recently identified the need to review the BFP to determine its appropriateness (DOE, 2013). This arises mainly from concerns regarding the continuous increases in prices and the impact on economic growth given that petroleum products are inputs to most business processes.

The debate about the appropriateness of the BFP must be understood in the context of the change in circumstances from the period that IPP pricing was adopted, when South Africa was importing most of its liquid fuel demand, to the current situation where almost all domestic liquid fuel consumption is met by domestic production. The price incentivised the oil companies to make investments in South Africa and compensated them for producing locally at the time of sanctions.

In addition, even after the changes made it appears that the imputed import parity price may still inflate oil industry margins. Singapore remains included in the calculation for petrol despite being further away from the South African ports than the Arab Gulf and the Mediterranean which are exporting regions of liquid fuels. There are also questions about the quality of fuel used in the BFP calculation being higher than that produced by South African refiners, especially prior to the implementation of clean fuels 1 in January 2006. In 2013 DOE investigated the difference between the current SA specifications versus current Euro specifications and found that on balance the oil companies are not receiving undue benefits (DOE, 2013). Lastly, imports may well be obtained at discounts to the benchmark reported prices and if the IPP system is to establish a realistic estimate of what it would cost to import substantial volumes of refined fuel there should be periodic reviews of the BFP calculation including the benchmark countries/regions used in the calculation and the indicators of price.

If imports by independents were not blocked then it would be easier to observe the sourcing and prices obtained for imports.

4.2 Wholesale and retail margins

To arrive at the final petrol pump price in the different fuel pricing zones (magisterial district zones), domestic costs, imposts, government taxes and margins are added to the BFP. In the current price structure this includes returns calculated for three main elements, namely, retail margin, wholesale margin and service differential. The retail margin is the return on investment and cost recovery in the retail service station; wholesale margin is the return on investment and cost recovery in the wholesaling of petroleum products; and service differential is the return on investment and cost recovery in the secondary storage and secondary distribution of petroleum products to the final consumer.

These margins have been calculated on a rate of return basis. The wholesale margin is regulated and was initially in the form of the Petroleum Activities Return (PAR) mechanism which was introduced in 1984. It applied the 15% overall return on assets managed benchmark which had applied to the industry prior to 1984 and was intended to ensure that the industry achieved a return of around 15%. In 1990 this was replaced by the Marketing of Petroleum Activities Return (MPAR), which applied to achieving benchmark returns for marketing assets only. The formula used to determine the wholesale margin was based on the results of a financial investigation by a chartered accountant firm into the profitability of the wholesale marketers. The level of the margin was calculated on an industry basis and was aimed at granting marketers a return targeted at 15% (within a range of 10% to 20%) on depreciated book values of assets, with allowance for additional depreciation, but before tax and payment of interest.

The methodology for the calculation of the margin required the consolidation and verification of results for the industry by an independent auditor, a process which historically took six to twelve months. A significant part of the delays resulted from the industry itself being slow in delivering their results to the auditors. This would then delay adjustments to the margin, however, there was no mechanism to compensate for over/under recovery.

Rate of return regulation is generally criticized for inducing over-spending on assets, known as ‘gold-plating’. A guaranteed industry return of 10% to 20% (especially when lower inflation and interest rates meant that this was higher than risk free returns) means if the industry as a whole has more expensive assets than necessary then the higher return will simply be passed through to consumers. Also, MPAR effectively guaranteed the oil industry a fixed rate of return irrespective of whether refineries were distributing efficiently or not.

The appropriateness of the MPAR was questioned by various sources (see Lloyd, 2001; Moerane Investigation, 2005; and WTTT, 2007) and recommendations were made for a re-evaluation of its usefulness as well as implementation. There is also an issue regarding the lack of transparency with regard to the calculation of the wholesale margin. Though the DoE refers to guidelines to calculate the wholesale margin, these are not available on the website. The main concern with the MPAR methodology was that it located the majority of the profits in the wholesale margin. This meant that independent site developers could not access a “return” on retail assets as it was captured in the wholesale margin for the supplier.

MPAR was replaced by the Regulatory Accounting System (RAS) in 2010. RAS for the Petroleum sector is used to determine appropriate margins for petrol at wholesale, retail, secondary storage and secondary distribution level. It seeks to introduce transparency into the market as well as root out inefficiencies, cross subsidization and uncontrolled costs. The margin for each activity is calculated based on benchmarks. The wholesale is margin is determined using cost accounting. Prior to the implementation of RAS the wholesale margin included the return on wholesale activities and partial return on retail assets. RAS separates these activities according their location in the value chain, that is, all the retail activities will be allocated under retail. This has had the effect of reducing the wholesale margin by 53% as the retail assets are now allocated under retail. However, this does not have an impact on the total margin. The retail margin is calculated on the basis of a benchmark service station of approximately 300 0000 litre throughput. The return is calculated based on the assets and costs recovery required to run such a service station. In this cost structure, account is taken of all proportionate driveway related costs such as rental, interest, labour and overheads. The storage margin is based on the four benchmark depots in South Africa. The secondary distribution margin is determined based on the number of trucks required to deliver the benchmark retailer volumes. The asset values for these vehicles are sourced from the road and freight association at replacement cost and maintenance costs are added.

RAS ultimately attempts to calculate a return for each part of the value chain where costs are incurred. The return is calculated once a year using the capital asset pricing model (CAPM) based on a replacement value of the assets. The previous year's value is indexed until such a time that the exact replacement value can be sourced. Depreciation is not taken into account. Secondary storage, secondary distribution, service differential and retail are separated as standalone activities.

Government taxes include various indirect taxes and levies applicable to fuels sold locally, for example Customs and Excise Duties, Fuel Levy, Equalisation Fund Levy, Road Accident Fund Levy, IP Marker Levy, petroleum pipelines levy and the Demand Side Management Levy.

A sum of all these components results in the price that the consumer will pay for fuel. There are also other aspects to fuels regulation that do not necessarily directly impact the calculation of the fuel price but impact on the state of competition in the market.

Challenges in the implementation of RAS

The retailing sector plays an important role in the development of SMEs and creating of employment. Due to the capital intensive nature of the refining level of the market, SME opportunities are limited and retailing presents the opportunity for development of the SMEs as envisaged by the Petroleum products Act of 1977 (as amended). There have been multiple changes to the regulations in an attempt to ensure the sustainability of different aspects of the liquid fuels value chain including retail. These include changes to the pricing regulations, licencing of activities and prohibition of presence at both the wholesale and retail levels.

The move from MPAR to RAS in the margin calculation has been well received by the industry, however, there are some concerns that the design of the system does not reflect the reality of the industry (FRA, 2013). RAS was designed based on the retailer owned, retailer operated (RORO) service stations, which account for only approximately 40% of service stations in

South Africa. The remaining 60% are company owned, retailer operated (CORO). The implication of this is that in a CORO site the wholesaler continues to enjoy profits from the retailing business, through rentals and franchise fees.

Historically the South African oil industry had a vertically integrated structure where companies would import crude oil or mine coal, refine these inputs into petroleum products and distribute products to company owned retail stations for sale to end consumers. When the RATPLAN was phased out one of the amendments to the Petroleum Products Act was to prohibit wholesale licencees from holding retail licences. Licencing was introduced to ensure that holders would not operate in more than one level of the value chain, however, oil companies still own assets in the retail businesses thus the issue of vertical integration has not been fully addressed. Fuel retailers operating CORO sites argue that the oil majors are able to claw back profits in these businesses and that this goes against the RAS principle that whoever incurs the costs must get the cost recovery and return on assets. This has led to disagreements between the companies and the operators and deadlock in contract negotiations.

A systematic approach to the implementation of the policy for the liquid fuels sector would require that the DOE first addresses the issues of vertical integration, then adjusts pricing mechanisms to ensure that the returns are allocated equitably at the different levels and this would create an environment that was conducive for entry by firms owned by historically disadvantaged South Africans. Designing the RAS system on a RORO benchmark retail site without fully addressing the issues related to vertical integration has created challenges for the implementation of the RAS system.

The RAS retail return is divided into two main components - the investor margin (60.4 cents in Dec 2013) and expenses cost recovery (78.7 c/l in Dec 2013). The expenses cost recovery covers the retail operator's expenses as well as repairs and maintenance on tanks and pumps that may be owned by the oil company. Fuel retailer argue that the investor margin should not all go to the oil company in the CORO sites as a part of that margin should be the 'entrepreneurial compensation' for the retail operator. Prior to the RAS system the return for the retailer's investment was drawn from the 'entrepreneurial compensation' which in 2012 was approximately 20.3 cents per litre. This entrepreneurial compensation is the source of the disagreements between the oil companies and retail operators in CORO sites.

RAS has been successful in isolating the profits relating to retailing from the wholesale margin. Before the implementation of the RAS system there was an understanding that in fuel retail 80% of business revenues were for covering expense and 20% for a return on investment. The expenses cost recovery simply covers operating expenses and the argument is thus that the investor margin should accommodate both the ownership and the operation of the assets. The RAS technical team agreed that an entrepreneurial compensation should be predetermined as a reward for the operator of the assets and that small business stock plus the market adjustability premiums should be used to calculate this reward (DOE, 2013). However, the split of the retail margin is not regulated by the Department and the retailers and oil companies must resolve the disputes.

While the RAS model is an improvement on MPAR, it still requires some refining. There are questions about the regulatory asset base, the return and the benchmark companies for the calculation.

4.3 Inland pricing

Both the Competition Tribunal in its evaluation of the proposed Sasol-Engen (uHambo) merger and the WTTT identified Sasol as being dominant and having market power in the inland market due to the logistics constraints in transporting fuel inland. This implies that Sasol can charge prices up to inland import parity, by adding on the transport costs of bringing product from the coast. Indeed, this is part of the calculation of an inland BFP, which uses the pipeline cost.

If the inland region is short of fuel and is in effect a net importer, then product transported from the coast is meeting demand at the margin. However, Sasol's production costs are very low. As reflected in the WTTT report, Sasol earned a fair return over costs when the oil price is at $28 per barrel (WTTT citing an assessment by an independent study in 2000). The oil price has been around $100 per barrel over recent years indicating Sasol has very high margins, even after allowing for the effects of inflation on costs. In effect, Sasol has a location advantage from its inland position, on top of an advantage relative to crude oil refineries given the capital investments already made in synfuels and the low cost of the coal feedstock.

Sasol's position had been entrenched under the regulatory regime on the justification that this was necessary to support investment in the synfuels business. The state brokered main supply agreement (MSA) meant that the other oil companies (OOCs) agreed to buy Sasol's synfuels production and Sasol agreed not to expand downstream into retailing. At the same time the position of the OOCs in wholesale and retail was protected as no others were allowed at this level. On building Sasol II and III in the 1970s the MSA was renegotiated to include the additional production and other oil companies were compensated for shutting back their production to accommodate the increased Sasol capacity. The compensation was raised through the fuel price in the form of synfuels levy introduced in 1984 and later reduced as the demand absorbed the mothballed capacity (Rustomjee, 2012).

In 1998 Sasol gave the required five year notice for the termination of the MSA, which meant it was free to go downstream from the end of 2003. However, this also meant that the OOCs were not required to buy Sasol's synfuels production. Sasol's strategy involved the planned merger with Engen which meant it would acquire the largest national distribution network along with a major coastal refinery and it would not need to sell as much to the OOCs as it could use its own network. The Sasol-Engen competition merger hearing revealed the bargaining that occurred over the prices to be charged following the ending of the MSA (and before the merger) when the other oil companies were no longer required to buy Sasol's fuel (see Corbett et al,. 2011).

The bargaining involved the OOCs holding back from purchases on the basis that Sasol with its low costs of production should be discounting off inland BFP. The OOCs sought to bring product from the coast instead of purchasing from Sasol. Sasol on its part sought to demand full BFP pricing and, rather than discounting, sought to sell into export markets and to cut back production at Natref. In the end, Sasol did provide discounts off the inland BFP for a number

of years, apparently until around 2007.[10] This bargaining over the inland fuel price sharply illustrates the importance of distribution infrastructure for buyers seeking to leverage alternatives, and of the willingness to cut back supply in order to secure high prices from customers.

The WTTT identified the challenge of disciplining Sasol's ability to set prices up to the inland BFP in the absence of effective supply competition in the inland market as a target for regulation and/or appropriate fiscal measures. The critical challenge is how to balance this with appropriately incentivising investment. The WTTT acknowledged the need to encourage increased investment in fuel production from local feedstock, which includes coal. However, rather than allowing continued monopoly prices for total production to incentivise expansions at the margin the WTTT recommended a package of 'smart' regulation. This included the combination of the regulation of inland prices at a level approximating competitive market prices (although this open to much interpretation), combined with a special levy on synfuels above a specified level and separate incentives for new investment in local fuels. Such an approach disciplines market power while providing direct incentives for expanded output at the margin.

This recommended approach was not adopted. Instead, the old trade-off was presented by National Treasury in their response to the WTTT report but without even firm commitments being required for investment. Instead, no action was taken on the WTTT recommendations based on expectations about the investments Sasol was to make in upstream fuel production and supporting downstream industry growth. Neither of these have materialised meaning we are in effect back where we were with no regulation of inland fuel prices beyond the import party based maximum benchmarks. The WTTT report should thus be revisited.

4.4 Information exchange

The price regulation allows for discounting off maximum prices in most cases, except for retail petrol. At the same time, the effective maximum price is posted by the DoE on a monthly basis at different levels of supply, such as through the posted Wholesale List Selling Price (WLSP) for most products. Competition between rivals will lead to discounts, while collusion has a readily available focal point.

The Competition Commission uncovered extensive sharing of information on sales volumes by the oil companies by magisterial district, customer category and fuel. What this means is that, until 2007, the oil companies could identify how much each of their supposed rivals was selling in each area. Given the oligopolistic nature and the history of cooperation such information exchange greatly increases transparency and in itself may have had the effect of stifling hidden competition (Das Nair *et al*, 2012). It undermines the incentives to compete through offering discounts as the other companies will readily be able to identify this and respond (Das Nair and Mncube, 2012). A player has no incentive to secretly discount to gain market share if it knows that this action is immediately visible to its competitors through the information exchange, who, given interdependencies in such markets, are likely to respond by also discounting (Corbett *et al*, 2010). The Commission referred a case of collusion against

[10] See the Competition Tribunal hearing in the polymers case (Competition Commission v Sasol Chemical Industries) where the value of fuel to Sasol was used as the alternative in pricing of propylene feedstock.

the oil companies on 24 October 2012 based largely on the companies exchanging information monthly on individual sales volumes to different customer categories by geographic area, in order to maintain profit levels above international norms.

5 Regulation and economic development

Due to the linkages in the liquid fuels value chain, a critical review of the regulation must encompass not only the regulation and impacts in the liquid fuels industry but also the impacts flowing through to the non-regulated products. The production of liquid fuels is closely linked to the value chain of many associated products (including chemicals and plastics), and includes commodities that are traded globally (crude and final products). In theory, rents can be extracted anywhere along the value chain, and also shifted between different commodities linked to the value chain (WTTT). The DOE views its role as managing the regulation of petroleum and petroleum products to ensure the optimum and orderly functioning of the petroleum industry to achieve Government's developmental goals. This is limited by legislation to the petroleum products discussed above and does not extend to fuel related products. What tools are there to address the unintended consequences of past regulation and market structure on the related products?

This complex situation poses a significant challenge to policy makers aiming to implement prudent fiscal and regulatory regimes while encouraging appropriate industry development (WTTT, 2007). We demonstrate the impact of regulation on linkages between fuel and chemicals production as well as review the maximum piped gas tariffs.

5.1 The impact of regulation on the linkages between fuel refining and chemicals production.

Sasol produces organic chemical feedstocks as co-products and by-products of its liquid fuels production and refining operations. It is the main producer of these chemicals in South Africa, producing far larger volumes of these products than its crude refinery counterparts elsewhere in the country due to the synthetic manner through which it produces fuel. Though some fuel prices are regulated, the prices of feedstock chemicals and certain end products are not. The synthetic fuels production process produces very high proportions of propylene relative to ethylene unlike other technologies, for example, naphtha cracking which is biased towards ethylene production.

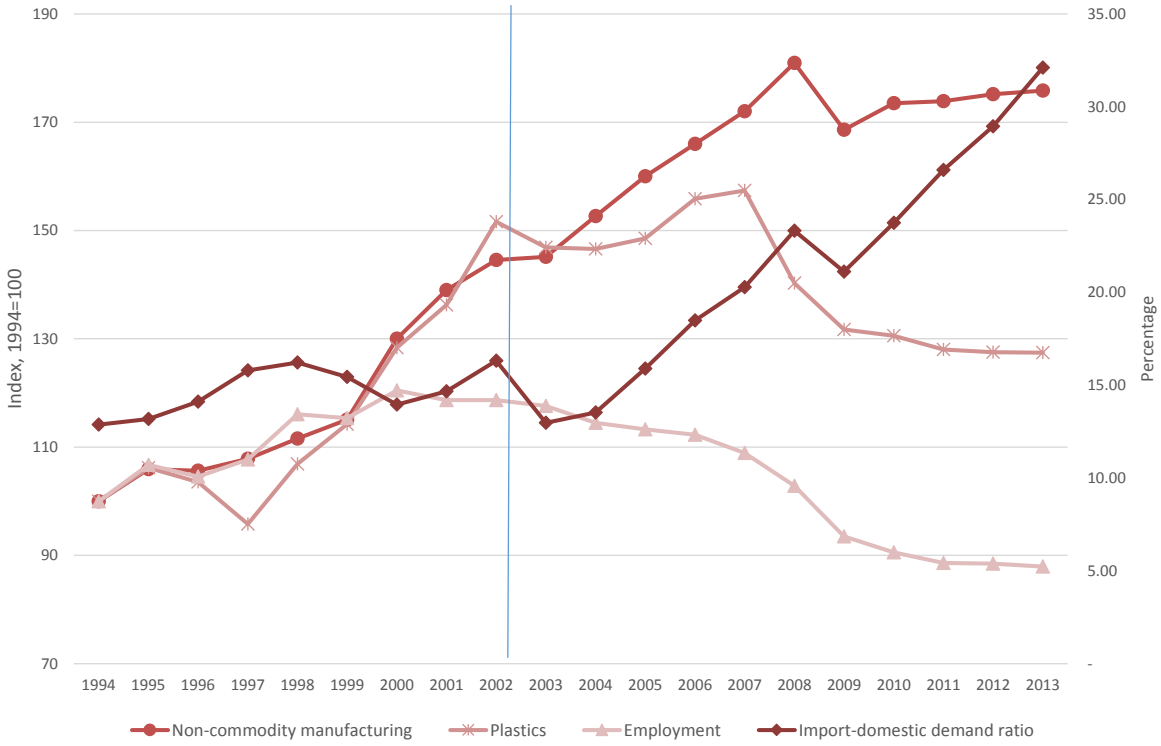
The investments to produce propylene are part of liquid fuels investment decisions. For example, Sasol's Project Turbo investments made primarily for cleaner fuels would have been unprofitable if it were not paired with investments in the purification of propylene and ethylene and subsequent polymerisation of the monomers (Engineering News, 2003). However the polymer prices are not subject to regulation.

These monomers can be combined into the fuel pool (for petrol, diesel) to a limited extent and with further processing required. It is international common practise to price monomers at a 'fuel alternative value' (FAV) reflecting the alternative that liquid fuels represent. As Synfuels produces so much propylene it is not in a position to combine all the propylene into the fuel

pool without compromising the fuel quality and thus Synfuels a relatively lower actual FAV than simply considering the processing costs for fuel production.[11] The propylene is made into polypropylene, a key input to plastics, and priced at IPP level despite net exports of around half of production.

The linkages between liquid fuels regulation and chemical feedstocks are highlighted by an independent review undertaken for the Liquid Fuels Industry Task Force in 1995 by Arthur Andersen. One issue was whether the protection of synfuels (through the regulatory framework) was having a negative effect on the pricing of chemical feedstocks and thus on the competitiveness of downstream businesses. Arthur Andersen concluded that the prices charged for chemical feedstocks were generally competitive as the local price for Polifin's (to become Sasol Chemical Industries) major product streams approximated the export price and were significantly lower than the import price.[12] This meant that the low cost advantage of chemical feedstocks (as by-products from fuels production) was at that time being passed on to the downstream plastic producers. However, Sasol had apparently changed its pricing behaviour by around 2000-2002, when it charged prices at IPP (a difference of some 20% to 30%). A review of the performance of the plastics sector shows that the industry was growing from about 1994 and there was a turning point between 2002 and 2003 (Figure 7).

Figure 7: Performance of the plastics sector output compared with other manufacturing, employment, and competition against imports



Source: Quantec

[11] The FAV calculation done by Sasol however did not take this into account.
[12] See para 5.74 of Arthur Andersen (1995)

Though there are a number of factors contributing to the decline in performance, the change in input prices played a major role. Raw materials, almost entirely made up of polymers, represent between 50% and 80% of production costs depending on the technology used to produce the plastic products.

Even for those products where the plastic product is a component, for example, in vehicles, the polymer pricing is important to the producer of that component which has to compete against imported components. For example, polypropylene accounts for up to 50% of the cost of a bumper for a motor vehicle; however the cost of a bumper is less than 1% of the cost of a typical vehicle and therefore importing the cheaper bumper is simply a function of competitiveness. This rationale that is put forward by the Fridge Study (2010) drawing on the work of Fedderke, which claims that the demand for 80% of polypropylene applications is relatively inelastic. Similar conclusions were reached for LDPE/LLDPE and PVC. It is worth stressing that calculating the aggregate elasticity by evaluating the portion of the PP cost in the final product is inappropriate when we wish to assess the effect on the competitiveness of local producers against imports. The question is not whether people will buy fewer cars if the cost of bumpers increases but whether the auto manufacturers will buy locally made or imported bumpers.

The post 1994 industrial policy clearly identified its objectives as to retain and increase the natural resource advantage that South Africa has, and to encourage the transfer of that natural resource advantage through to the growth of downstream, higher value-added and labour intensive industries (Rustomjee, 2012). The DTI is concerned about poor growth of labour-absorbing downstream industries, such as plastic products. The polymers industry was identified by Industrial Policy Action Plan (IPAP) as a priority sector for beneficiation. Consistent with this, the Department of Trade and Industry (DTI) then requested the Competition Commission to look into the polymers sector specifically to assess whether the polymer input pricing was competitive so as to create a conducive environment for downstream beneficiation. The competition regime is meant to address dominant firm conduct, including excessive pricing. The DTI requested the Competition Commission to investigate polymer pricing in 2007. The Commission initiated a case after initial research. While the initial concerns by the DTI related to polymer products, the pricing of polymers is also closely related to the pricing and supply of monomers, which are the key inputs or chemical ‘building blocks’ in polymer production.

Though the Commission investigated the pricing of all domestically produced polymers including PVC, HDPE, LDPE and PET, the case referred to the Competition Tribunal alleged excessive pricing of propylene and polypropylene by Sasol Chemical Industries (SCI). The Commission investigated the pricing of polypropylene and propylene and found that Sasol charges import parity prices for polypropylene despite production of polypropylene vastly exceeding demand in the domestic market. The CFR Hong Kong Price is usually taken as a base and then notional freight, handling and transport costs are added to get to a landed price in the inland regions of South Africa (see also Dobreva, 2006). Until recently, a notional 10% duty charge was also added to this. This pricing mechanism bears no relation to the actual costs of producing polypropylene in South Africa and the customer pays as though they are importing when the product is produced locally.

The propylene from which polypropylene is made has been priced against the imported polypropylene price with allowance made for the processing costs to convert propylene to polypropylene. However, aside from being able to export it as polypropylene, the value of propylene is the alternative uses. The main one is fuel, giving a 'fuel alternative value' (FAV), depending on the costs of conversion and the price that can be obtained for the fuel.

Although the retail petrol price is regulated on an import parity basis, Sasol chooses instead to sell a large proportion of propylene into export markets as polypropylene. According to the Commission's referred case, this indicates the real value. While alternative uses provide a value for a product such as propylene, Sasol's propylene has a lower value in the fuel pool than for many crude oil refineries, as a result in Sasol's case of the high volumes that are produced from the synfuels operation and the process used to combine propylene to make fuel (van Rensburg, 2010). In addition to the existing excess capacity in the form of polypropylene production, Sasol embarked on the construction of Project Turbo following government requirements for cleaner fuels, and chose to substantially increase the production of propylene and polypropylene even further.

In the Tribunal proceedings SCI argued that with regard to the definition of economic value, the advantage from cheap feedstock is a 'special advantage' to Sasol and that Sasol should retain the profits flowing from this advantage. The Competition Act defines an excessive price as one which bears no reasonable relation to economic value and is above that value, to the detriment of consumers. This leaves open the question as to what is economic value and what is 'no reasonable relation' when evaluating the prices charged against the economic value? It was common cause that Sasol's costs of producing polypropylene are lower than almost all other countries while its prices to local customers have been higher. The key question was whether the lower implied costs of feedstock propylene (due to its abundance and the unattractive alternatives for this by-product, at the margin) should be passed on to local consumers of purified propylene and polypropylene in the form of more competitive prices or whether Sasol would retain the cost advantage.

The Tribunal ruling on June 2014 found that Sasol had charged excessive prices for propylene and polypropylene and rejected Sasol's defence regarding the costs advantages. The Tribunal decision came after the hearings were concluded in October 2013, of the case which was referred in August 2010. This followed the initiation of the investigation in November 2007. The Tribunal decision may still be appealed meaning it may be several years before any remedies are applied. This is not unique to this case as abuse of dominance cases tend to last several years. No other policies have been pursued in meantime, neither industrial nor regulatory measures.

The case study illustrates how the competition regime is seized with a unilateral pricing question of an entrenched dominant firm (essentially a natural monopoly) of a non-regulated product that is effectively a by-product of a set of products (liquid fuels) which are regulated. In this sense, the competition authorities are playing the role of regulator of last resort. We note that in the 1990s an evaluation of fuels regulation (Arthur Andersen, 1995) *had* assessed the linkages between the fuel regime and the pricing of polymers chemicals, rather than treating them as completely separate. In other words, there is now less coordination than there

was in 1990s. The need to consider the relationship between fuels regulation and pricing of chemical feedstocks was also highlighted by the WTTT (2007).

Traditionally competition law is presented as being about addressing structural changes (mergers) and conduct (collusion and exclusionary arrangements) in the absence of which there would be competition, while economic regulation controls market power in instances where competition is either not possible or is not desirable (de Streel, 2004; Lang 2009). However, in reality there are reasons why dominance can persist without the firms necessarily being efficient or innovative. First-mover advantages, a history of state support and scale economies can all mean that an incumbent can maintain its position and the returns from it in the absence of easily identifiable anti-competitive arrangements. This is especially likely in smaller economies such as South Africa's. The litigious nature of competition law means that the effects of abuse of dominance on consumers and economic growth may take many years to address, while alternative regulatory solutions could more readily deal the outcomes. In addition, the apparent change in polymers pricing around 2000 to 2002 to increase to IPP levels further points to the need to assess and monitor conduct over time.

5.2 A review the structure of the maximum piped-gas price tariff

We look at the case of natural gas in light of the review of fuel regulation. Sasol secured the rights to natural gas from the Mpande and Temane fields in Mozambique and, together with the governments of Mozambique and South Africa, has exploited this gas and constructed a pipeline of approximately 600km to transport it to Secunda. There was no specific legislation for gas projects at the time (around 2000) and thus a regulatory regime had to be negotiated. The South African Government and Sasol Gas concluded the "RSA Regulatory Agreement", giving Sasol Gas a Special Regulatory Dispensation regarding exclusive rights to ROMPCO's infrastructure (mainly the pipeline) for a period of 10 years from the first gas received by Sasol (from 2004 to 2014).[13]

Shortly after the conclusion of this agreement the Gas Act of 2001 was enacted with the primary objective of promoting the efficient, effective, sustainable and orderly development and operation of gas transmission, storage, distribution, liquefaction and re-gasification facilities and the provision of efficient, effective and sustainable gas transmission, storage, distribution, liquefaction, re-gasification and trading services. Other objectives of the Act are to:

- facilitate investment in the gas industry;
- ensure that gas transmission, storage, distribution, trading, liquefaction and re-gasification services are provided on an equitable basis and that the interests and needs of all parties concerned are taken into consideration;
- promote the development of competitive markets for gas and gas services; and
- promote access to gas in an affordable and safe manner.

Sasol Gas' special regulatory dispensation came to an end on 25 March 2014. After this date, NERSA is mandated by the Gas Act, 2001 to approve maximum prices for all classes of

[13] Nersa Market value pricing explanatory notes

customers of piped-gas and enforce non-discrimination. However, the requirement to approve maximum prices is contingent on NERSA determining that "there is inadequate competition as contemplated in Chapters 2 and 3 of the Competition Act, 1998".

During the special dispensation, in line with the provisions of the "RSA Regulatory Agreement", Sasol priced using the 'market value pricing' (MVP) principle defined in the agreement as the determination of gas price in terms of:

- the cost of the alternative fuel delivered to the customer's premises or anticipated place of use (in the case of Greenfields Customers); plus
- the difference between all the operating costs of the customer's use of alternative fuel and all the operating costs of using natural gas; plus
- the difference between the Net Present Value (NPV) of the capital costs of the customer's continued use of the alternative fuel and the NPV of the capital costs involved in switching to natural gas, as would be reflected in the customer's accounts.

Schedule One of the Agreement indicated that a price above the MVP would constitute non-compliance and a breach of Sasol Gas's licence conditions. This pricing methodology produced a price cap for Sasol Gas and it could negotiate with individual customers. The discount was based on annual quantity purchased and there were three categories of discounts.[14]

Clause 8 of Schedule One of the Agreement also provides for a price cap on the average gas price that Sasol charges customers using up to ten (10) million gigajoules of gas per annum. The mechanism places a limit on Sasol's revenues from gas sales compared to a benchmark established using prices of several European countries, known as the European Benchmark Price (EBP). The Sasol Volume Weighted Average Gas Price for customers may not exceed the EBP.[15] In the event that it does customers may claim refunds from Sasol Gas.

In effect, the MVP is just the maximum price which Sasol Gas can charge while just attracting different customers to switch. At no point was the weighted average price above the EBP, however, note that the weighting means that this is almost entirely due to large customers which includes the prices charged to customers which are associated with Sasol itself (such as Spring Lights Gas in which Sasol has a substantial shareholding).

Nersa did receive a number of complaints from customers about the implementation of the regulated price and Nersa's investigations suggested that there were discrepancies in Sasol Gas' implementation.[16] However, it is not clear what, if any, steps were taken.

Proposed pricing from March 2014

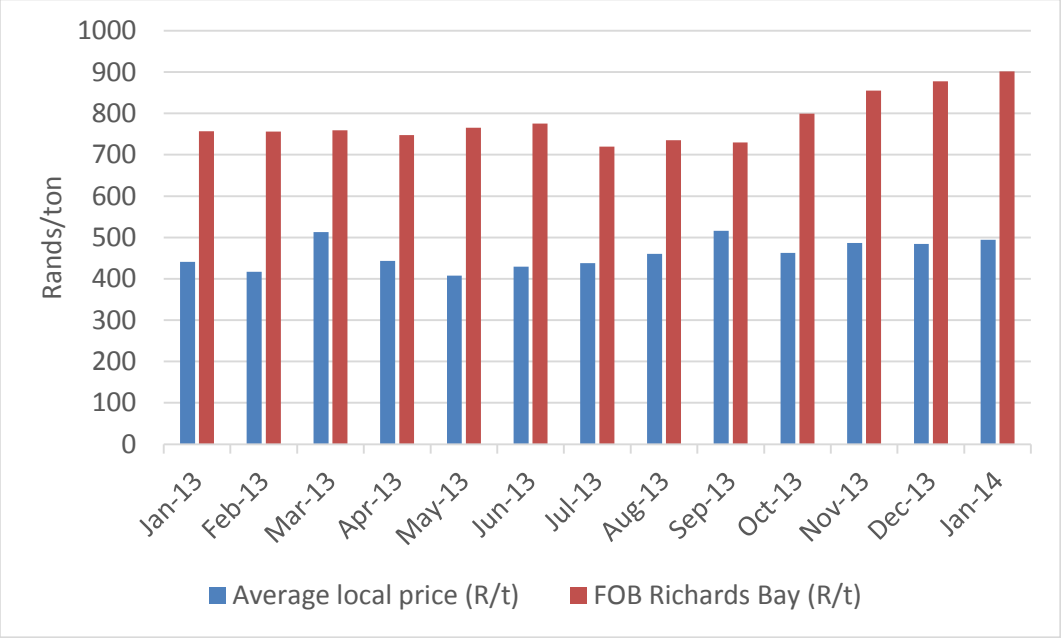
In 2011 NERSA published its proposed methodology for the calculation of maximum gas prices from March 2014 onwards. This sets the maximum gas price against a basket of alternative fuels in South Africa. There are also tariff guidelines applicable to the transmission, storage and reticulation of gas. We focus here on the maximum gas price regulation.

[14] NERSA market value pricing explanatory notes
[15] NERSA, Price Regulation of Piped-Gas 2005/6
[16] NERSA market value pricing explanatory notes

The maximum gas price weights the prices of alternative fuels based on the total energy consumption of coal, diesel, electricity, heavy fuel oil (HFO) and LPG. This means that coal has a weight of 36.2%, diesel 24.8% and electricity 37.1% with HFO and LPG collectively accounting for just 3%. It is thus critical to the outcome what prices are used for coal, diesel and electricity.

The coal price that is used in the determination is the free-on-board thermal coal price at Richards Bay Coal Terminal (converted into rands per gigajoule). This is thus not the coal price that users of gas are likely to have been using as an alternative for two reasons. First, South Africa exports high quality coal while it consumes low quality coal, this translates into much higher export prices than domestic prices. Second, most industry gas users are inland and the inland coal price (for export grade coal) is lower than at Richards Bay by the transport cost to transport coal to the coast. There are therefore significant price differences for coal consumed locally and that of export coal (see Figure 8). We understand that the choice to use the FOB Richards Bay price was driven by the need to have transparent prices and the export price is widely reported. We note that the Department of Minerals and Energy (DMR) keeps track of inland coal prices by different grades on a monthly basis and NERSA could request that these prices be made available. On average the Richards Bay FOB price is above the local price by 70% (Figure 8).

Figure 8: Domestic versus Export Coal Prices



Source: World Bank[17] and DOE

[17] http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:21574907~menuPK:7859231~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html

An alternative to using the DMR would be to continue using the Richards Bay prices but remove the rail transport costs from the inland region (where most of the coal is mined) to Richards Bay.

The diesel price used is the basic fuel price for diesel, per litre converted to rands per gigajoule. The data is sourced from the Department of Energy. As the inland diesel price is higher than the (coastal) BFP this is lower than it would be for inland consumers. However, the substantial weight of diesel reflects national energy use (mainly for road vehicles) rather than the proportion of industry users that use diesel.

The electricity price is the Eskom average tariff approved by NERSA, per kWh converted into Rands per gigajoule. The average tariff approved by NERSA is an average of all Eskom's customer groupings. Bulk and industrial customers (a large proportion of consumers of piped gas) pay less than the average Eskom Tariff. This means that the electricity indicator used in the calculation of maximum gas prices is higher than it would be had an average price for industry users been adopted.

Sasol Gas Ltd has applied and NERSA has approved maximum gas prices for the prescribed customer categories for a multi-year period from 26 March 2014 to 30 June 2017 (Table 3).

Table 3: Approved Maximum Piped Gas Price

	GJ p.a	Gas Energy Price (GE) - R/GJ forecast 2014	Reductions %	Reduction (R/GJ)	Sasol GE (R/GJ) (26/3/2014)	NERSA approved (26/3/2013)
Class 1	< 400	128	7.50%	9.6	R118	R108.86
Class 2	401 – 4 000	128	7.50%	9.6	R118	R108.86
Class 3	4 001 – 40 000	128	15.00%	19.2	R109	R100.04
Class 4	40 001 – 400 000	128	22.50%	28.8	R99	R91.21
Class 5	400 001 – 4 000 000	128	30.00%	38.4	R90	R82.38
Class 6	> 4 000 000	128	37.50%	48	R80	R73.56

Source: NERSA consultation document

80% of Sasol Gas customers (by number, not volume) were expected to receive price reductions after the implementation of the approved maximum prices.[18] This is corroborated by the NERSA consultation document which states that most of the small customers may receive price decreases.[19] However it is important to breakdown the customers that are expected to prices to decreases relative to the total volumes sold to external customers (Table 4).

[18] http://www.engineeringnews.co.za/article/big-manufacturers-turn-to-courts-amid-unhappiness-with-gas-pricing-sasol-contract-talks-2013-10-18

[19] NERSA piped gas consultation Document 26 March 2013

Table 4: Breakdown of price increases by customer size

	Total	Total in %	volume	% Volume
*Small Customers that will/ may face decreases	268	58%	1 872 400	3%
Small Customers that may face increases	74	16%	1 227 600	2%
#Large Customers that may/will face decreases	66	14%	22 323 100	36%
Large Customers that may face increases	57	12%	36 576 900	59%
Total customers	465	100%	62 000 000	100%
All Customers facing price decreases		72%		39%
All Customers facing price increase		28%		61%

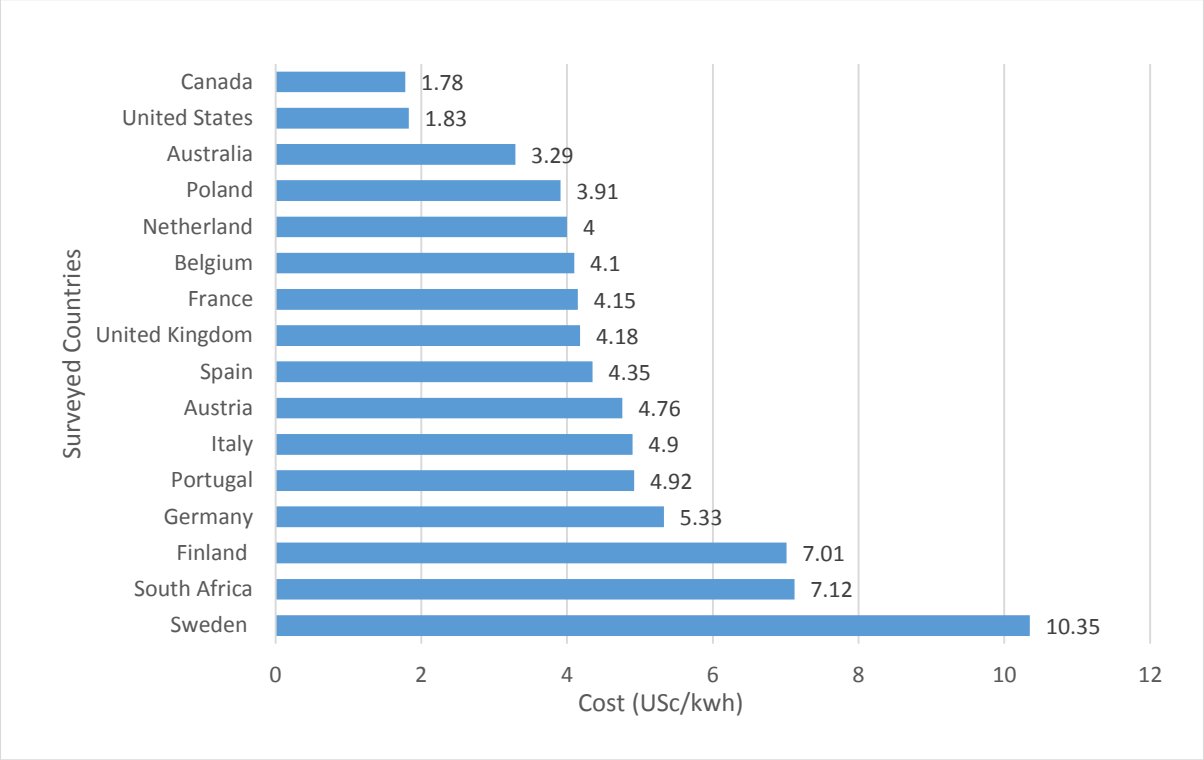
Source: derived from data in the Piped Gas consultation document of 26 March 2013

Notes: *Small customers are class 1-3
#Large customers are class 4-6

Though the approved maximum gas price may result in a decrease in prices for most customers it is more appropriate to look at this in terms of the volumes purchased by the customers and not simply the number of customers. This gives an indication of the impact of the balance of price increase and decreases on the economy. Sasol's application simply applies the methodology published by NERSA in 2011 and does not give any further details. We assess the outcomes by first comparing South African natural gas prices to other countries, undertake an illustrative exercise to examine what the different prices and weights would have realised had they been implemented in 2011, and then check if Sasol Gas has been profitable in the years leading to the change in methodology.

A comparison of South African natural gas prices to 15 countries including the 6 "European Benchmark Price" countries, shows that South Africa has the second highest gas prices out of the surveyed countries (Figure 9). In 2011 South Africa was ranked as having the 3rd highest prices after Sweden and Finland and was higher than all 6 "European Benchmark Price" Countries.

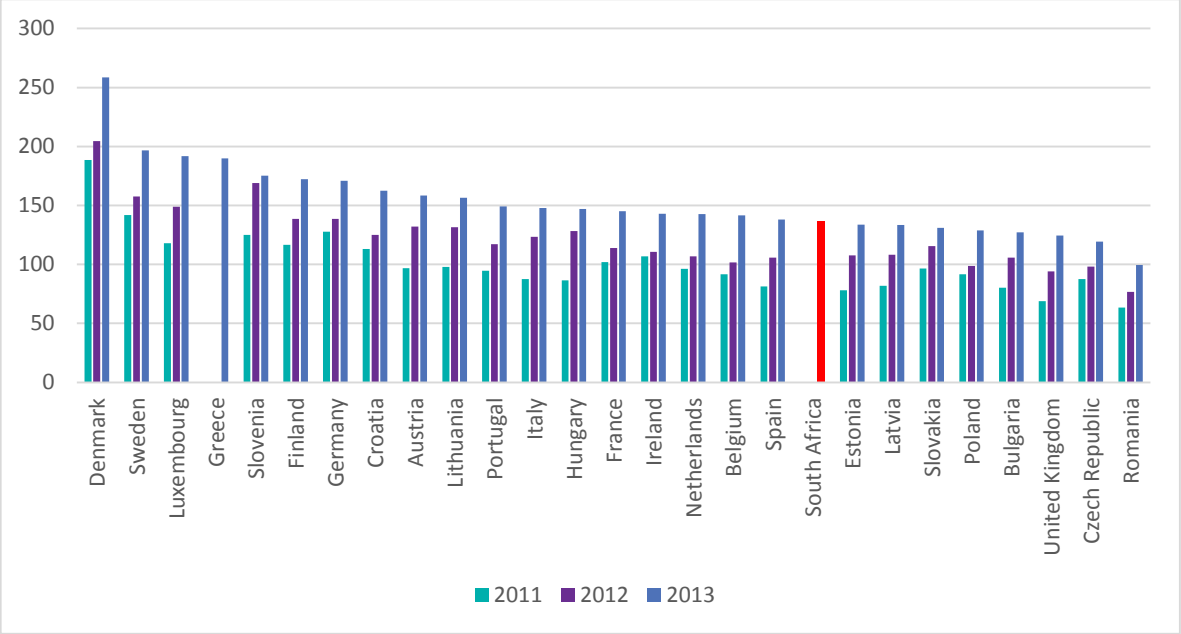
Figure 9: 2012 International Natural Gas Cost Comparison



Source: NUS Consulting Group's 2011-2012 International Electricity & Natural Gas Report and Price Survey
Notes: The survey is based on prices as of 1 June 2012 for a natural gas supply of 1,250,000 kWh per month, in US cents excluding VAT.

A comparison using a different data set shows the South African natural gas prices falling within the lowest third in a ranking from highest priced to lowest priced European Union economies (Figure 10). This picture is different partly because of the inclusion of a large number of higher priced, gas importing, European countries. The gas price arrived at for Class 3 customers (industrial customers using between 4,001GJ and 40,000GJ) in South Africa compares relatively favourably with prices for larger customers in the European Union (Figure 10). Note that relatively smaller customers on average (4,001GJ – 40,000GJ per annum) are being compared to relatively larger customers in the EU (10,000GJ – 100,000GJ per annum).

Figure 10: South Africa class 3 price in Gauteng as at March 2013 (4,001GJ – 40,000GJ per annum, including Sasol tariffs) compared to EU industrial tariffs (10,000GJ – 100,000GJ per annum) (ZAR / GJ)*



Source: Eurostat

* Exchange rates: 2011: R10.06/EUR; 2012: R10.50/EUR; 2013: R12.79/EUR

The result of the regulatory regime depends on the weights and the prices used. As we saw with the regulation of liquid fuels prices an apparently innocuous change such as to the source country or spot versus posted prices can make a significant impact on the result. We consider the impact of the choice of weights and prices for alternative energy sources used in the gas pricing calculation by considering what prices would have been realised under different scenarios for 2011.

We consider the effect of using an inland coal price rather than the export FOB Richards Bay price which reduces the gas price by 7%.[20] Third we consider the impact of using an industrial electricity tariff rather than the average Eskom tariff and the gas price is reduced by 8%.[21] Taken together, these changes would reduce the maximum gas price calculated following the NERSA methodology for 2014 (applied to 2011 data) from R103.40 to R87.16 (Table 4).

The weights used for energy sources have been based on overall energy usage in the country and not the usage by industry of different energy sources. Using weights for energy sources based on industry usage has the effect of increasing the coal and electricity weights substantially to 49.55% and 44.96% respectively, while the diesel weight falls to just 5.45% (see Weights-B in Table 2).[22] As diesel is the most expensive fuel the impact of the change in the weights reduces the maximum price substantially, by 17%. The combined effect of the

[20] 2011 Data sourced from the DOE, South African Price Report, 2012 page 60.
[21] 2011 Data sourced from the DOE, South African Price Report, 2012 page 56.
[22] Calculated from DoE Energy balances data, http://www.energy.gov.za/files/energyStats_frame.html

different energy prices and weights to reflect industrial users (Nersa Price versus Price B) has the effect of reducing the calculated maximum price by 37% (Table 4).

Table 4: Illustrative calculation of maximum gas prices under different weights and prices for alternative fuels

	Weights-A	NERSA Price (R/GJ)	Price-A (R/GJ)	Weights-B	Price-B (R/GJ)
Coal	36.2%	11.29	2.63	49.55%	3.60
Diesel	24.8%	38.62	38.62	5.45%	8.49
Electricity	37.1%	50.97	43.40	44.96%	52.61
HFO	1.1%	1.40	1.40	0.04%	0.05
LPG	0.8%	1.11	1.11	0%	0.00
Weighted Maximum	**100%**	**103.40**	**87.16**	**100%**	**64.75**

Notes and sources:

Weights-A are the weights prescribed by NERSA calculated on the overall consumption of the selected energy indicators for 2008.

Weights-B are calculated based on the DOE's industry consumption of the selected energy indicators, for 2008.

NERSA price: is the maximum gas price for 2011 as per the NERSA methodology and benchmarks.

Price-A: is calculated using the formula stipulated in the NERSA maximum price methodology but substituting the export FOB coal price with the local free-on-rail (FOR) price and the average Eskom tariff with the industrial tariff. Both the FOR and the Industrial electricity tariff are sourced from the DOE South African Energy Price Report, 2012.

Price-B changes the coal and electricity prices and uses Weights-B for the calculation.

To soften the blow on large energy users who face price increases, Sasol has committed to a transitional price mechanism whereby prices will be increased in tranches. For those with price increases between 15% and 30%, 15% will apply on 26 March 2014 and the remainder will be applied on a quarterly basis between March 2014 and March 2015. For those customers that that are faced with price increases between 30% and 45%, 15% will be applied on March 2014 and the difference will be spread over the period between March 2014 and March 2016. It can also be argued that the transaction prices and not only the methodology for maximum gas prices need to be taken into account. Sasol in practice discounts below the maximum prices. However, this is a different issue from what should be the regulated maximum which is meant to constrain unilateral pricing power.

Large industrial users of gas have objected to the methodology and resulting prices indicating that gas represents approximately 20% of large manufactures' input costs and the proposed increases will put pressure on the margins of these firms (Creamer, 2013). These customers have complained that the new pricing methodology is disadvantaging those who have invested in switching to gas, which is perceived to be more efficient and affordable (Radebe, 2013).[23]

[23] http://www.moneyweb.co.za/moneyweb-industrials/sa-gas-the-most-uncompetitive-prices-globally

NERSA was reported as stating that the methodology was designed to attract investors in the gas market by offering high returns (Mail and Guardian, 2013). NERSA has to balance the desire for fair and competitive pricing with the need to ensure that the gas sector becomes more attractive for investors as per the Gas Act of 2001. In this assessment it needs to be considered whether there are likely entrants into the market for inland gas supply and in what time period, given that this new dispensation is in place for three years. In addition, the barriers to entry in into this market appear high. Furthermore, an entrant needs to consider the price that would prevail once they have entered and not the price being charged before entry.

The experience of liquid fuels regulation at imputed import parity prices highlighted the differences that arose from the choice of prices and costs to use in the calculation. In the maximum gas price calculations there are similarly substantial differences depending on the choice of prices for the benchmark to use. The published financial statements also reflect that Sasol Gas has been making operating profit margins in the range between 38% and 47% from 2005 to 2012 (Table 5).

Table 5: Sasol Gas Turnover and Operating Profit

Financial Year	2012	2011	2010	2009	2008	2007	2006	2005
Turnover, Rmn	6931	5445	5371	5666	4697	3702	3209	2404
Operating profit, Rmn	2985	2578	2479	2424	1785	1936	1526	931
Operating profit margin, %	43	47	46	43	38	52	48	39

Source: Sasol Group Limited financial statements

6 Conclusion

We sum-up by considering the regulatory record against the objectives of ensuring security of supply, restricting the exertion of market power, incentivizing investment and opening up participation in the sector. At a high level, there are strong threads of continuity.

The South African fuel pricing system based on IPP was generous during the apartheid years, as it ensured the profitability of the oil companies and provided an incentive to the multinationals initially to invest in refining assets and, subsequently, to remain in South Africa despite pressures to disinvest due to sanctions. Though the threat of sanctions fell away with the advent of democracy, the greatest weight has continued to be given to the local refining industry on the grounds of security of supply, rather than a reorientation to trading and distribution to ensure customer-responsive supply.

There have been changes in terms of amendments to the import-parity based system for liquid fuels to obtain measures closer to what fuel could actually be imported for. In addition, there has been entry into distribution and retail. However, the core challenges identified by the WTTT remain and the apparent reasons for their recommendations to be set aside have not been realized in the form of substantial investments upstream in new refining capacity.

The amendments to the import parity measure reveal just how much additional margin was being made by upstream refiners. The significance of different benchmarks and sources of information also highlights just how information asymmetry in favour of the industry players can advantage these interests over those of consumers. Moreover, the basis for the price determination for liquid fuels has not changed, in particular, with regard to taking into account Sasol's privileged position and very low costs. While the gas price has moved to using a yardstick, or benchmark approach, the choice of components in the benchmark has favoured the supplier, again apparently on the grounds of incentives for investment.

The WTTT recommended that fuel price regulation could be reduced to price cap regulation for a period of time to determine what aspects of regulation will be required going forward, and the prohibition of discounting and purchasing incentives should be discontinued. It also recommended that the quantitative import controls should be removed allowing increased participation in the importation and trading of liquid fuels. Further there should be a combination of tighter price regulation in the inland market and taxation of the windfall profits of synfuels (being a windfall from the low cost coal feedstock) coupled with investment incentives to stimulate new capacity. The recommendations of the WTTT need to be revisited as they address the dual challenges of restricting the exercise of market power to extract supra-competitive rents while at the same time incentivising investment in expanded capacity.

While there have been some changes, the basic architecture of the regulatory framework has been retained. Rather than relaxing regulation downstream, there has been greater attention paid to trying to estimate costs and rates of return in wholesaling, storage, distribution and retail, which is very demanding in terms of information and analysis. With tighter upstream regulation and increased participation in wholesale and retail (as we have started to see) then increased competition would mean less need to micro-regulate downstream activities. Access

to trading and distribution remains substantially restricted although greater participation would likely contribute to more efficient supply arrangements.

The changes to the downstream regulation have not been without challenges. The RAS model is posing challenges to CORO retail sites and, even though import licenses for refined petroleum products have been extended to independent wholesalers, access to essential logistics infrastructure is a barrier to importing. Competition in the downstream markets is still not on a level playing field and the legacy of state ownership and regulation for “insiders” means that the status quo is biased against new entrants in the form of independents.

The chemicals products case study illustrates how a unilateral pricing question of an entrenched dominant firm (essentially a natural monopoly) of a non-regulated product that is effectively a by-product of liquid fuels, which are regulated, left the competition authorities to play the role of regulator of last resort for these products without being able to benefit from or coordinate with the wider regulatory tools that exist.

The review of regulation of natural gas highlighted the importance of learning the lessons of liquid fuel regulation. It is critical to pay attention to the detail of the specification and measurement of the components of the benchmarks used to set maximum prices, as well as to the in principle choices about how to identify the yardsticks to be used. Again, there is typically an information asymmetry between the industry and the regulator. The essential challenge also remains of establishing a framework to support exploration and investment in expanded capacity while not simply entrenching the market power and position of a single incumbent. One important element is to ensure that infrastructure such as pipelines are available to other potential market participants.

Regulatory frameworks set the ‘rules of the game’ which requires a balancing of interests. In the South African liquid fuels industry the so called ‘rules of the game’ were designed to benefit fuel refiners. Though there have been changes to the regulations in an attempt to level the playing field, the outcomes do not appear consistent with the required balance as defined by the Energy White Paper of 1998.

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