GENERAL NOTICE

NOTICE 24 OF 2014

DEPARTMENT OF ENERGY

DRAFT POSITION PAPER ON THE SOUTH AFRICAN BIOFUELS REGULATORY FRAMEWORK

The Minister of Energy, in terms of Section 17 of the National Energy Act, 2008 (Act No.34 of 2008), hereby publishes the Draft Position Paper on the South African Biofuels Regulatory Framework in the Schedule hereto, for public comment.

Members of the public are invited to submit to the Minister, **by the 10th of February 2014**, written comments to the following address:

By post to: The Department of Energy

Attention: Mr. Muzi W. Mkhize

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Written comments may also be hand delivered at: Matimba House, 6th Floor, 192 Visagie Street, Corner Paul Kruger and Visagie Streets, Pretoria.

Any enquiries in connection with the Draft Position Paper on the South African Biofuels Regulatory Framework can be directed to Mr. Ompi Aphane or Mr. Muzi W. Mkhize at **(012) 406 7571/7662/7680**.

Comments received after the closing date may not be considered.

DEPARTMENT OF ENERGY

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POSITION PAPER ON THE SOUTH AFRICAN BIOFUELS REGULATORY FRAMEWORK

"The First Phase of the Implementation of the Biofuels Industrial Strategy"

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EXECUTIVE SUMMARY

1. Introduction

The Government of South Africa has identified the biofuels industry as a potential major source of employment and economic development. In 2005, Cabinet directed the then Department of Minerals and Energy (DME) to lead and coordinate the development of a Biofuels Industrial Strategy through an inter-departmental Biofuels Task Team (BTT). The Biofuels Industrial Strategy of the Republic of South Africa (hereto attached as **Annexure A**), was approved by Cabinet on 5 December 2007. This strategy envisages a five-year pilot phase, covering 2008 to 2013, during which a two percent (2%) penetration level of biofuels in the national liquid fuels (petrol and diesel) pool needs to be achieved.

2. Implementation of the Biofuels Industrial Strategy

Despite the approval of the Biofuels Industrial Strategy, no single large scale biofuels industry player has emerged, as was envisaged by the Biofuels Industrial Strategy, to date. This is attributed to the fact that biofuels projects are, on their own, not financially attractive at the prevailing feedstock and crude oil / liquid fuels prices. In order to address this challenge, the Department of Energy (DoE), in consultation with the BTT, focused on the implementation, monitoring and refinement of the Biofuels Industrial Strategy through creating a regulatory environment that is conducive to the production of biofuels. Regulations regarding the Mandatory Blending of Biofuels with Petrol and Diesel (hereinafter referred to as "Mandatory Blending Regulations") and the licensing of manufacturers of biofuels were among other tools introduced in pursuance of this objective. The, development of an appropriate Biofuels Pricing Framework, in conjunction with National Treasury (NT) and other economic sector departments, to financially incentivise the production of biofuels also commenced.

3. Mandatory Blending Regulations

The Mandatory Blending Regulations were promulgated on 23 August 2012 to come into effect on a date, then, to be announced by the Minister of Energy. On 30 September 2013, the Minister of Energy announced the 01st of October 2013 as the effective date for the Mandatory Blending Regulations. The Minister of Energy also approved the establishment of a Biofuels Implementation Committee (BIC), comprising the oil and biofuels industries (and Transnet as well as other parties as and when required). The BIC, which is chaired by the DoE, seeks to address all matters pertaining to the practicalities of blending biofuels with (mineral) petrol and diesel.

4. Licensing of Manufacturers of Biofuels

Having developed the Criteria for Licensing Manufacturers of Biofuels in terms of the Petroleum Products Act, 1977 (Act No. 120 of 1977), as amended, licence applications for the manufacturing of biofuels were received and processed by the Office of the Controller of Petroleum Products. These criteria incorporate the requirements of the Biofuels Industrial Strategy while considering sustainability issues in the context of the said Act and the South Africa's peculiar conditions. Four (4) bio-ethanol and four (4) biodiesel manufacturing license applications for the manufacturing of biofuels have thus far been issued or granted by the Office of the Controller of Petroleum Products at the DoE. The total production volume for the proposed bio-ethanol projects is 393 million litres per annum whilst for biodiesel projects it is 970 million litres per annum.

5. Biofuels Pricing Framework and Reference Crops

The Biofuels Pricing Framework needs to provide for efficient investments in bio-ethanol and biodiesel manufacturing facilities, commensurate returns on investments made, operating costs and the levels at which biofuels manufacturing entities will be subsidised.

The pricing models used are based on reference (benchmark or "ideal") plants and form the basis for calculating the biofuels incentives. The models are essentially financial models of the reference plants and include variable cost information and average local pricing, as well as fixed costs factorised on turnover and capital expenditure (capex). A guaranteed return on assets (ROA) of 15% for biofuels manufacturers has been deemed sufficient to reward private capital and risk-taking under current and foreseeable market conditions: *ROA = (Earnings before interest & taxes) / Total assets.*

The incentive is then the gap between the actual market-related earnings and the earnings required to achieve the 15% ROA for the benchmark plant.

Towards the end of the joint development work of the DoE and NT, together with other BTT members, concerns were raised regarding the use of a model based on sorghum as the only reference feedstock / crop for bio-ethanol production. This resulted in a series of discussions among all parties concerned. As a result, three approaches have been examined namely:

- The use of a one reference crop as a feedstock versus a selection of crops;
- Consideration of more than one crop (i.e. multiple reference crops), in particular sorghum and sugar cane for bio-ethanol production; and
- The use of an entirely crop-neutral bidding process.

In view of the need to expedite the first phase of the implementation of the Biofuels Industrial Strategy, it is recommended that grain sorghum and soya beans should be the only reference feedstocks for the manufacturing of bio-ethanol and biodiesel respectively.

6. Criteria For Eligibility for Government's Support for Manufacturers of Biofuels

The set criteria for eligibility of manufacturers of biofuels for Government's support are premised on requiring individual biofuels projects to benefit the country at macro-economic level to justify their subsidisation. Eligibility for the subsidy scheme will be on a first-come, first-served basis, subject to meeting predetermined economic development criteria, in terms of reaching the market with sellable product and with reference to actual production and not mere plant capacity. Hence the subsidy pay-outs will be based on actual litres of biofuels blended. Based on lessons learnt during the first phase of the implementation of the Biofuels Industrial Strategy, there will be a revision of the subsidy mechanism for penetration levels above 2% to include stricter criteria for food and water security as well as environmental impacts.

7. Administration of the Collection the Biofuels Levy and Disbursement thereof

A levy earmarked for the subsidisation of manufacturers of biofuels will be part of the General Fuel Levy applicable to all petrol and diesel consumed nationally. Funds collected through the imposition of the levy would then be disbursed by the DoE to eligible manufacturers of biofuels based on set criteria. The DoE, in conjunction with NT and the South African Revenue Services (SARS), will devise a mechanism for the disbursement of the collected levy.

8. The Biofuels Implementation Committee and Blending Logistics

The actual process of blending could occur at either refinery or depot level. Blending at refinery level, however, would require that biofuels be transported a considerable distance from their source of manufacture to each of the six refineries in the country. Furthermore, from a technical perspective, biofuel blends cannot be readily transported via multiproduct pipelines, mainly because of potential contamination of jet A1 in the pipeline as well as potential metallurgy and material incompatibility effects (stress corrosion cracking, seals, etc.).

The said issue as well as other matters related to the blending of biofuels with petrol and diesel are being dealt with by the BIC. They will be concluded on time for the implementation of the Biofuels Mandatory Blending Regulations by the 01st of October 2015.

1. INTRODUCTION

The Government of South Africa has identified the biofuel industry as a potential major source of employment and economic development. Biofuels are deemed to have played a substantial role in ameliorating the decline in agriculture, especially in industrialised and middle-income developing countries, where agriculture's broader social and rural development attributes have been recognised and prioritised. This has played an important role in reducing the social costs associated with high rates of urbanisation and the resultant pressure on urban infrastructure. Hence, in 2005, Cabinet directed the then Department of Minerals and Energy (DME) to lead and coordinate the development of a Biofuels Industrial Strategy through an inter-departmental Biofuels Task Team (BTT).

Through the collaborative efforts of the BTT, the then DME developed a Biofuels Industrial Strategy of the Republic of South Africa (hereto attached as **Annexure A**), which was approved by Cabinet on 5 December 2007.

The Biofuels Industrial Strategy envisages a five-year pilot phase, covering 2008 to 2013, during which a two percent (2%) penetration level of biofuels in the national liquid fuels (petrol and diesel) pool needs to be achieved. Based on the total national fuel pool of about 20 billion litres per annum, this translates into a target of slightly more than 400 million litres per annum by the end of 2013. This target was revised downward from the 4.5% target that was initially proposed in the draft Strategy document considering the challenges encountered whilst developing the biofuels industry. Whereas exceeding the 2% penetration level would be deemed a great success, caution has to be exercised against unintended consequences (e.g. consequentially more subsidy payments than anticipated as well as pressure exerted on food, water resources and the environment).

The Department of Energy (DoE) undertook a study to determine the value-add of blending bio-ethanol with conventional petrol and supplying the blended petrol to end users. This value, called the Bio-ethanol Blending Value quantifies the benefits and costs of bio-ethanol as a petrol blend component and may be positive or negative. The Blending Value has been found to be best at a concentration of 2%, to decrease with increasing concentration to be worst at 5% and then improve to be second best at 10%. Hence when a subsidy scheme is applied, the quantum of the subsidy per litre of blended petrol would correlate with the concentration of bio-ethanol in the blended petrol, the least being at 2% concentration.

2. IMPLEMENTATION OF THE BIOFUELS INDUSTRIAL STRATEGY

Despite the approval of the Biofuels Industrial Strategy, South Africa is still without a single large scale biofuels industry player to date. This is basically due to the fact that biofuels projects are not financially attractive at the prevailing feedstock and crude oil / liquid fuels prices. In order to address this challenge, the DoE, in

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consultation with the BTT, focused on the implementation, monitoring and refinement of the Biofuels Industrial Strategy through:

- Creating a regulatory environment that is conducive to the production of biofuels. Regulations regarding the Mandatory Blending of Biofuels with Petrol and Diesel (hereinafter referred to as "Mandatory Blending Regulations") were, amongst other tools, deemed to be the most appropriate legal instrument to achieve the desired outcome. The Mandatory Blending Regulations would guarantee the uptake of all biofuels supplied by licensed biofuels manufacturers by compelling licensed manufacturers of petroleum products and their wholesaling arms to buy and blend all the biofuels availed by licensed biofuels manufacturers;

- The licensing of manufacturers of biofuels in terms of the Petroleum Products Act, 1977 (Act No. 120 of 1977), as amended. The Department duly developed criteria for the licensing of manufacturers of biofuels under the said Act, which are hereto attached as **Annexure B**. Manufacturers of biofuels that have since been licensed are listed under **paragraph 5.2** below. However, none of the licensed manufacturers, other than those using waste oil, have commenced constructing their plants;

- The development of an appropriate Biofuels Pricing Framework, in conjunction with National Treasury (NT) and other economic sector departments, to financially incentivise the production of biofuels. For biodiesel manufacturers, this included granting them a 50% General Fuel Levy exemption and allowing for accelerated depreciation (50:30:20) on their manufacturing facilities as tax incentives. A similar rebate could not be instituted for bio-ethanol as it falls outside the fuel tax net. Hence the Department, together with NT in particular, embarked on a process of developing an appropriate incentive mechanism for bio-ethanol; and

- Supporting projects that would have already been in progress while the aforementioned legal or regulatory environment is being created. This includes encouraging government agencies to:

    - participate in the initial investments into biofuels;
    - confirm the suitability of the use of biofuels;
    - ensure that market access is provided for biofuels; and
    - to ensure that emerging farmers are also involved.

Being mindful of this, the BTT adopted a Government-owned biofuels project, the Cradock Sugar Beet to Bio-ethanol Project (the "Arengo Project"), as a case study to identify key issues that will require policy, regulatory, technical, and other enabling mechanisms. The Arengo Project's shareholders were originally CEF (SOC) Limited and the Industrial Development Corporation (IDC) prior to the former's withdrawal.

3. MANDATORY BLENDING REGULATIONS

On 23 August 2012, Regulations regarding the Mandatory Blending of Biofuels with Petrol and Diesel (hereinafter referred to as "Mandatory Blending Regulations"), were promulgated to come into effect on a date to be announced by the Minister of Energy. It was initially envisaged that the announcement of the said date will be preceded by the finalisation of the Biofuels Pricing Framework. Due to delays regarding the latter and the need to ensure that biofuels projects underway proceed as desired, it was deemed prudent that the date be announced prior to the finalisation of the Biofuels Pricing Framework.

The Minister of Energy announced, through Government Notice No. R.719 of 30 September 2013 of Government Gazette No. 36890, that 1 October 2015 is the effective date of Mandatory Blending Regulations. A copy of the Mandatory Blending Regulations (Government Gazette No. 9808 Vol. 566 of 23 August 2012, Reg. No. 35623) and a copy of the Government Notice announcing the effective date of these Regulations are hereto attached under **Annexure C**.

The effective date was set with the understanding that all outstanding issues, including the installation of the requisite infrastructure to enable the blending of biofuels, would have been completed before this date. Hence the Minister of Energy also approved the establishment of a Biofuels Implementation Committee (BIC) comprising the oil and biofuels industries (and Transnet as well as other parties as and when required). The BIC, which is chaired by the DoE, seeks to address all matters pertaining to the practicalities of blending biofuels with (mineral) petrol and diesel. The inaugural meeting of the BIC was held on 30 August 2013. Meanwhile, the Cabinet-mandated interdepartmental Biofuels Task Team (BTT) continues to provide the necessary guidance and oversight on matters pertaining to the implementation of the Biofuels Industrial Strategy.

The Biofuels Industrial Strategy came at the back of the promulgation of the inaugural Regulations regarding Petroleum Products Specifications and Standards, under the programme that is now referred to as Cleaner Fuels 1 (CF1). The promulgation of the Regulations regarding Petroleum Products Specifications and Standards, on 23 June 2006, was a major step towards creating a regulatory environment that is conducive to the commercial production of biofuels. According to the country's Regulations regarding Petroleum Products Specifications and Standards, biodiesel may be blended at different concentrations into conventional (mineral) diesel, right from 5% biodiesel (B5) even up to 100% biodiesel (B100). With bio-ethanol however the permitted concentration range is linked to the oxygenate specification for petrol, which allows the blending of ethanol to range from 2% to about 10% on a volumetric basis. This specification is derived from the oxygenate and volatility specifications for (blended) petrol.

The further tightening of the petroleum products specifications and standards, under the Cleaner Fuels 2 (CF2) Programme, seeks to, among other things; expedite the production and blending of biofuels (both biodiesel and bio-ethanol) into the mineral fuel pool. One of the changes in this regard is that the CF2 specification allows for the Reid Vapour Pressure (RVP) of 65 kPa maximum with a 5 kPa waiver allowed when ethanol is used. The other change is the adjustment of the octane-related specifications for petrol to ensure that the aforementioned 2% to 10% concentration range for bio-ethanol remains applicable at all times in all regions of South Africa.

4. LICENSING OF MANUFACTURERS OF BIOFUELS

The DoE developed Criteria for Licensing Manufacturers of Biofuels in terms of the Petroleum Products Act, 1977 (Act No. 120 of 1977), as amended. The criteria incorporate the requirements of the Biofuels Industrial Strategy while considering sustainability issues in the context of the said Act and the South African conditions. They have been used by the Office of the Controller of Petroleum Products in the DoE to evaluate applications for biofuels manufacturing licences.

4.1 Framework for sustainable production and use of biofuels

Whilst biofuels are internationally recognised as the immediate and less carbon-intensive substitute and complementary fuel for fossil-derived fuels, there is much international concern about the unintended potential adverse impacts on the environment, the global economy and the society at large. This sobering statement has prompted some countries, developing and developed, to adopt sustainable means of producing and using biofuels in order to maintain the renewability feature of the fuel.

However, a cautionary approach ought to be adopted when introducing sustainability criteria for liquid biofuels as compliance thereto normally comes at a premium for investors. At regional level, the Southern African Development Community (SADC) Energy Ministers approved a "SADC Framework for Sustainable Biofuel Use and Production" on 29 April 2010 in Luanda, Angola. This SADC Framework is hereto attached as **Annexure D**.

Having fully appreciated the SADC potential to produce biofuels whilst contributing towards the achievement of other national developmental goals, the SADC Biofuels Framework was aimed at providing Member States with a set of basic guidelines for the development of sustainable biofuel strategies. The end game was for Member States to adapt these regional principles to local contexts, as South Africa has done.

4.2 Licensing of Manufactures of Biofuels in South Africa

Table 1 below lists the licence applications for the manufacturing of biofuels that have thus far been processed by the Controller of Petroleum Products:

Company Name	Crop / Feedstock	Capacity (million litres per annum)	Location	License status
BIO-ETHANOL				
Mabele Fuels	Sorghum	158	Bothaville, Free State	Issued[1]
Ubuhle Renewable Energy	Sugarcane	50	Jozini, KwaZulu Natal	Issued
E10 Petroleum Africa CC	Sugarcane and other crops	4.2	Gauteng , Germiston	Granted[2]
ARENGO 316 (PTY) LTD	Sorghum and sugar beet	180 (in 2 phases of 90 each)	Cradock, Eastern Cape	Granted
TOTAL BIO-ETHANOL CAPACITY		**392.2**		
BIODIESEL				
Rainbow Nation Renewable Fuels Ltd.	Soya Bean	288	Port Elizabeth, Eastern Cape	Issued
Exol Oil Refinery	Waste Vegetable Oil	12	Krugersdorp, Gauteng	Granted
Phyto Energy	Canola	> 500	Port Elizabeth, Eastern Cape	Early stages of license application
Basfour 3528 (Pty) Ltd	Soya beans	170	Berlin, Eastern Cape	Issued
TOTAL BIODIESEL CAPACITY		**970**		

Table 1: Status of Applications for Biofuels Manufacturing Licenses

The total capacity of the envisaged biofuels plants is about 1,262 million litres per annum, which, if realised, would exceed the 2% penetration level of biofuels in the national liquid fuel supply, being about 6.3%. *Table 1* above clearly indicates that the envisaged capacity of ethanol alone would meet the 2% penetration target.

It is however important to note that none of the above-mentioned plants have been constructed, let alone commissioned. The lack of an appropriate Biofuels Pricing Mechanism is largely to blame for this lack of progress.

[1] ***Issued*** means the applicant has met all the requirements and is now in possession of a manufacturing license

[2] ***Granted*** means the applicant has not met all the requirements but is now in possession of a **conditional** manufacturing license

5. BIOFUELS PRICING FRAMEWORK

The Biofuels Pricing Framework makes provision for efficient investments in bio-ethanol and biodiesel manufacturing facilities, proper returns on investments, limited manufacturing costs, the break-even point of manufacturing costs and the levels at which biofuels manufacturing entities will be subsidised. The DoE undertook two projects that comprise the pillars of the Biofuels Framework, namely:

- The Biofuels Break-even Price Determination project, which entails a study to determine the break-even price for biofuels (bio-ethanol or biodiesel) for an optimally sized and efficiently operated biofuel manufacturing plant with a rate of return on assets (ROA) of 15%; and

- The Bio-ethanol Blending Value project, which entails a study to determine the value-add of blending bio-ethanol with conventional petrol and supplying the blended petrol to end users. In order to do blending at refineries and depots, investments in blending facilities will have to be made by the major oil companies and working capital, due to complex operations, will be required on an on-going basis. As a result of the payback of capital investment and the impact of bio-ethanol on blending operations, the Blending Value has been found to be negative in most cases, although it may be positive in some instances, particularly at low blending levels. The transfer price of bio-ethanol from bio-ethanol manufacturers to the major oil companies will need to make provision for the blending of petrol and bio-ethanol.

At the conclusion of the two projects, sorghum was found to be the crop that would require the least subsidy for bio-ethanol production while soya beans were found to be the best crop to use for biodiesel production. The results found then are summarised in *Table 2* below:

Item	Bio-ethanol (Sorghum)	Biodiesel (Soya Beans)
Incentive for 15% ROA (includes any rebate)	195 cpl	253 cpl
Reference plant capacity	158 million litres	113 million litres
Estimated job creation per reference plant, including multiplier effects	8,247	20,067
Estimated greenhouse gas emissions savings	30%	50%

Table 2: Summary of Model Results for most Efficient Crops / Feedstock

Based on the revised model, the Minister of Finance, in his 2013 Budget Review, indicated that a subsidy will be afforded to manufacturers of biofuels through a levy on petrol and diesel ranging between 3.5 cents per litre (cpl) to 4.5 cpl. The administration of the levy is explained in paragraph 8 below.

It is also worth noting that the establishment of a biodiesel manufacturing industry initially looked simpler compared to that of bio-ethanol. Matters pertaining to pricing, fuels specifications and logistics for bio-diesel are less complex due its chemical and physical characteristics. However, it later emerged that vegetable oil, produced as an intermediate product in the manufacture of biodiesel, attracts a better return in the cooking oil market. This explains why the prospects for massive commercial manufacturing of biodiesel have not materialised despite incentivising biodiesel manufacturers through a 50% General Fuel Levy exemption and affording them accelerated depreciation (50:30:20) on their manufacturing plants. The saving grace for biodiesel production could be that, in the presence of a Biofuels Pricing Mechanism with subsidies, some of the players might find it attractive to produce biodiesel and get lower but predictable margins than to opt for the riskier cooking oil business with higher margins.

5.1 Major Biofuels Pricing Model Assumptions

The pricing models are based on benchmark (reference or "ideal") plants and form the basis for calculating the biofuels incentives. The models are essentially financial models of the reference plants and include variable cost information and average local pricing, as well as fixed costs factorised on turnover and capital expenditure (capex). A guaranteed return on assets (ROA) of 15% for biofuel manufacturers has been set.

$$ROA = \frac{Earnings\ before\ interest\ \&\ taxes}{Total\ assets}$$

The incentive is the gap between the actual market-related earnings and the earnings required to achieve the 15% ROA for the benchmark plant. The incentive is then calculated on a per litre biofuel basis to provide the subsidy based on biofuel volumes actually sold by individual manufacturers. In calculating the total assets, the cash balance is ignored and depreciation is applied on a straight-line basis over the economic lifetime of the plant, namely twenty (20) years.

The major assumptions are listed below:

Assumption	Bio-ethanol	Biodiesel
Reference Feedstock	Grain Sorghum	Soya Beans
Efficient Plant Capacity	158,000 m³/a	113,000 m³/a
Capital Investment (2011)	R2,131 million	R1,135 million
Feedstock Consumption	2.40 t/m³	5.40 t/m³
Feedstock Pricing Basis	SAFEX Sorghum	SAFEX Soya
Co-product Credits	0.53 t/m³ DDGS	4.10 t/m³ Soya Meal 0.11 t/m³ Glycerol
Co-product Pricing Basis	DGGS = 80% SAFEX Yellow Maize	Soya Meal = 110% SAFEX soya
Total Variable Costs, excluding Feedstock (2011)	R102 million	R129 million
Total Fixed Costs (2011)	R235 million	R172 million
Annual Cost Escalation (Capex and Opex)	PPI & CPI	PPI & CPI
Working Capital	Stock = 15 days Debtors = 45 days Creditors = 30 Days	Stock = 15 days Debtors = 45 days Creditors = 30 Days
Biofuel Pricing Basis	BFP ULP95 + Zone Differential + Blending Value	BFP ULSD + Zone Differential

The pricing rules are further elaborated on **Annexure E** attached.

5.2 Biofuels Blending Logistics

While a 2% penetration of biofuels in the national fuel pool is targeted in the introductory phase of biofuels blending, it is not practical that every litre of fuel in South Africa will contain 2% biofuels. This is due to logistical infrastructure requirements and costs related thereto as well as the fact that such a blending regime would introduce unnecessary complexity at a stage when biofuels penetration is very low. Rather, flexibility is proposed in that the concentration of biofuels may vary between, say, 5% and 10% of a certain portion of the fuel pool on a geographic basis, most likely in close proximity to the biofuels manufacturing plants, which are most likely to be located inland.

The actual process of blending could occur at either refinery or depot level. Blending at refinery level, however, would require that the biofuels are transported a considerable distance from their source of manufacture to each of the six refineries in the country, which are located at Secunda, Sasolburg, Durban (two refineries), Mossel Bay and Cape Town. This would have significant logistics cost implications to the biofuel manufacturer, especially considering that only road transport would be viable for movement of biofuels since

there is no rail or pipeline infrastructure between the likely points of biofuels manufacture and the refineries. It also means that for at least four refineries, biofuel would be moved from a point where the magisterial zone district system has allocated an inland transport cost to BFP (zone differential, which is a component of the biofuel selling price) back to the coast where the zone differential is much lower than in the inland areas. Since the delivered price of biofuel is now lower than what would have been received from an inland delivery point (refinery or depot), this "loss" to the biofuel manufacturer would have to be added to the increased transport costs and ultimately recovered from the motorist via the biofuels incentive.

Furthermore, from a technical perspective, biofuel blends cannot be readily transported via multiproduct pipelines, mainly because of potential contamination of jet A1 in the pipeline through "trailback", as well as potential metallurgy and material incompatibility issues (stress corrosion cracking, seals, etc.). This means that biofuels and their blends with petrol or diesel cannot be transported in the New Multi-Product Pipeline (NMPP) or the old Durban-to-Johannesburg Pipeline (DJP) and other pipelines. This requires that they be transported by road and rail, severely undermining an already constrained logistical system, which could lead to security of supply problems.

In addition, petrol-ethanol mixtures must be distributed in a completely dry logistical system because of the natural affinity of ethanol for water. Any water in pipelines and other storage and distribution facilities can be picked up as ethanol flows through the pipeline network. The water-ethanol mixture tends to separate from petroleum products with which it may be mixed / blended, resulting in degraded fuel quality.

As a result, the most practical and cost-effective manner to blend biofuels during the introductory phase is at depot level, which avoids the constraints and costs associated with refinery blending, particularly at the coast. Refinery blending may still be feasible for the two inland refineries (Secunda and Natref). Hence, a mixture of depot and refinery blending is envisaged during the introductory phase. When the biofuels blending penetration is increased in a subsequent phase, the decision about where blending should take place should be reviewed, taking into account the possibility to capitalise on the beneficial properties of biofuels and synergies with the programme to further tighten fuel specifications and standards, dubbed Cleaner Fuels 2.

It is noted that depot blending has implications regarding Customs and Excise and fuel tax as duty at source (DAS) that need to be aligned with the South African Revenue Services (SARS). It is proposed that fuel ethanol be included as a "fuel levy good" (biodiesel is already included) and that the full suite of fuel taxes, duties and levies (DAS) be collected at the biofuel manufacturing point. The depots at which blending occurs would also have to be registered with SARS as current legislation defines manufacture to include blending in the Petroleum Products Act, unless the legislation is amended to exclude biofuel blending as a manufacturing activity. In addition, it should be noted that fuel ethanol manufacturers will denature the ethanol with a small amount of petrol (up to 5%) before it leaves the manufacturing facility (VM). Thus, petrol received by the

ethanol distillery, specifically for denaturing purposes will already be duty paid, so the filled DA 160 monthly return forms on ethanol despatches would show a credit. Similarly, any deliveries at a refinery would require that the refinery claims a credit on the monthly DA 160 for 100% (actual litres) of the fuel ethanol received, as the fuel ethanol is duty paid at source. It is assumed that there will not be accounting for DAS at depot level as both products are duty-paid.

6. REFERENCE CROPS AND THE BIOFUELS PRICING FRAMEWORK

Towards the end of the joint development work of the DoE and NT, together with other BTT members, concerns were raised regarding the use of a model based on sorghum as the only reference feedstock / crop for bio-ethanol production. Potential users of crops other than sorghum as feedstock indicated that they would not invest in a biofuels venture that has a subsidy that is based on sorghum as a reference feedstock / crop. Those intending to use sorghum echoed the same sentiment regarding the use of other crops as reference feedstock. Hence alternative means to accommodate other crops whilst avoiding putting the fiscus under undue pressure had to be considered. This was the main cause of the delay in finalising the Biofuels Pricing Framework.

The most common feedstock worldwide are sugarcane and maize for the production of bio-ethanol and soya beans, rapeseed and, to a lesser extent, palm oil for the production of biodiesel. The Biofuels Industrial Strategy proposes sugarcane and sugar beet for the production of bio-ethanol and sunflower, canola and soya beans for the production of biodiesel. The exclusion of other crops and plants such as maize is based on the food security concerns while Jatropha's exclusion is due to biodiversity concerns and to protect local bird and animal species from poisoning. Jatropha is an alien plant with leaves and pods that are toxic.

The selection of particular crops as reference crops in the Biofuels Pricing Framework is a sensitive matter. For a crop that is not referenced, this could amount to its technical exclusion (or non-recognition) for the production of biofuels. For a country with a history of unfair discrimination of various kinds, it is important to ensure that such 'discrimination' is justified. This is even more important when one notes that crops would grow only in certain areas due to the climate and geographic conditions, which determine crop choice, hence which feedstock can be grown economically.

Based on the studies undertaken by the DoE; namely, the Bio-ethanol Blending Value Determination and the Determination of the Break-even Price of Biofuels Manufacturing, grain sorghum and sugarcane emerged as the most appropriate commercial crops for bio-ethanol production. Soya beans and sunflower seeds emerged as the most appropriate commercial crops for biodiesel production. Large quantities of these potential feedstock are grown locally and experience exists to expand their production. It is also noted that sugar beet has not been grown on a large scale in South Africa and no information exists in the public domain on costs,

prices, etc. However, economically, sugar beet would be valued on its intrinsic sugar content and hence the pricing analysis would be similar to sugar cane.

These feedstock were chosen on the basis of the average subsidy required to achieve a 15% return on assets (ROA) in terms of the DoE Biofuels Pricing Model over the past three years. Feedstock costs generally constitute more than 65% of the cost of biofuels manufacture and the net raw materials costs are the strongest driver of the amount of subsidy required to incentivise biofuels production.

6.1 One reference crop as a feedstock versus a selection of crops

Initially the stance adopted was that sorghum, as it appeared to be the crop with best financial performance (albeit still negative) compared to other crops in the model, should be the reference crop for bio-ethanol production. However, it should be noted that agricultural crops go through commodity cycles with respect to their prices. That is, the price could be low today only to increase in the future. There are however those crops whose commodity cycles, and matters incidental thereto, are related or linked as well as those that are totally unrelated.

Although the selection of sorghum as a reference crop seemed plausible, it later emerged that this would deter investments from potential investors intending to use other crops that are financially comparable to sorghum but have an unrelated commodity cycle. For example, the sugar industry, through the South African Sugar Association (SASA), stated that its members cannot invest in the manufacturing of bio-ethanol if only grain sorghum (or any other crop with an unrelated commodity cycle) is the reference crop. Conversely, the licensed manufacturers of biofuels who intend to use sorghum to produce bio-ethanol confirmed that they would be unwilling to invest in an environment where sugar (cane) is the only reference crop. The said positions arise from the fact that the two crops have different commodity price cycles, which introduces significant commercial risk when the subsidy calculated on one reference class of crops (e.g. grains) is applied to bio-ethanol production based on another class of crops (e.g. sugar-based feedstock).

The foregoing prompted the review of the stance adopted with respect to reference crops, which led to the consideration of options outlined below.

6.2 Option 1: Consideration of more than one crops (i.e. multiple reference crops)

It is also worth noting that commercial scale manufacturing of bio-ethanol has not commenced yet and that there is no vast difference in outputs of the financial model between sorghum and sugar. Considering the foregoing, as well as the fact that the implementation of the Biofuels Industrial Strategy is still at a pilot phase, it was deemed prudent that two reference crops be adopted for bio-ethanol, namely:

(1) sorghum should be the reference crop for grains and starches; and

(2) sugarcane should be the reference crop for non-grain / starch (sugar-based) crops.

The approach has the advantage that it is pragmatic and practical to implement as only two crops serve as reference for the many crops from which bio-ethanol can be manufactured. Otherwise numerous models would be required, thereby creating unmanageable complexity, which addresses the difficult question as to why only two feedstocks are considered and not more (i.e. one needs to draw the line somewhere).

With respect to biodiesel there is a vast difference in the financial viability of soya beans to that of sunflower seed (financials for canola seeds would be similar to that of sunflower seeds), with soya beans being the more financially efficient option. Hence using soya beans as the only reference crop does not seem to be a challenge, especially now that it is still a pilot phase. This is also supported by the fact that a biodiesel manufacturing facility is more likely to be a multi-feedstock plant than one that manufactures bio-ethanol. By choosing the crop that needs much lower subsidies than other oilseeds, the fiscus / motorist should also be protected from undue pressure of crops that would require bigger subsidies and that do not provide additional macroeconomic benefits. Biodiesel is further complicated by the fact that the alternative market for vegetable oil is the cooking oil market where it can be sold at a higher price than its diesel equivalent price. As a result, there may be less interest from potential investors to invest in biodiesel manufacturing capacity than for bio-ethanol. However, the guaranteed return of the biofuels incentive mechanism eliminates market risk and could, at some stage, be attractive to some investors rather than to face the volatility of the cooking oil market.

The above-mentioned positions need to be reviewed for subsequent phases where the penetration would be in excess of 2%. For example, a number of crops could be referenced provided that they do not exceed twenty percent of the subsidy offered to the best financially performing crop over a specified period. It should also be noted that being cited as a reference crop does not automatically qualify a project, which uses that crop as a feedstock to manufacture biofuels, for Government subsidy. Each project will be scrutinised for such qualification in terms of the "Criteria to Qualify as a Beneficiary under Government's Biofuels Subsidy Scheme". In addition, the biofuels manufacturer does not only have to use the reference crops in order to qualify as a beneficiary. An investor's decision to use a specific crop as raw material will depend on his view of the financial viability of his project in light of the reference feedstock used in the models.

6.3 Option 2: Consideration of only one crop (i.e. single, most efficient reference crop)

The other viewpoint is that, as a principle, the biofuel subsidy should be based on the most cost effective and efficient feedstock in order to minimise the impact on the fiscus/motorists and ensure a financially sustainable industry in the long run. It argues that the reference price for biofuels needs to be based on a single feedstock rather than multiple crops to enhance the probability of such financial sustainability, improve transparency and

certainty in calculating the subsidy. The principle of certainty is critical as it influences investment decisions in the sector and allows for financing to be secured. A complex subsidy mechanism can result in reduced transparency and the unintended consequence of deterring investments.

A subsidy based on multiple crops could introduce unnecessary complexity as it prejudices feedstock that do not neatly fall into the categories of selected reference crops (i.e. neither sugar nor sorghum, for bio-ethanol production). It could also be deemed to be diverting from the principle of efficiency because, over a particular period, one of the (two) feedstock would be less efficient. The subsidy on the less efficient crop would imply that inefficiencies are incentivised, with the negative impact on the fiscus / motorists being no longer minimised.

One might attempt to provide some simplicity by taking an average price between sugarcane and sorghum as an option to deal with this dilemma. However, this would inevitably result in one feedstock "losing" as the reference price will be lower than the higher priced feedstock. Furthermore, it would create uncertainty for both feedstock as prices are dependent on two feedstock rather than one.

Since the net raw materials costs are the strongest driver of the amount of subsidy required to incentivise biofuels production, the most efficient crop would be the one requiring the least amount of subsidy. Based on the model outputs for a historical price trend over three years , it is then proposed that grain sorghum should be the reference feedstock for bio-ethanol and soya for biodiesel. It could however be argued that a historical price trend longer than three years should have been used.

The historical price trends over a longer period reflect that sugar has at times been the more cost effective commodity than sorghum. However, projected future trends suggest a narrowing in the raw material cost between these commodities, with sugarcane becoming more expensive than sorghum in the future long term. This view is supported by projections from the University of Pretoria's Bureau of Food and Agricultural Policy (BFAP) Agricultural Outlook 2013-2022, published in August 2013. As indicated in Figure 1 below, sorghum producer prices are expected to increase from about R3,010/t in 2013 to R3,840/t in 2022, an increase of 31% over the period. On the other hand, Figure 2 below indicates that sugarcane prices are anticipated to increase from about R390/t in 2013 to R530/t in 2022, an increase of 42% in nominal terms.

Figure 1: Sorghum Price Forecasts (BFAP)

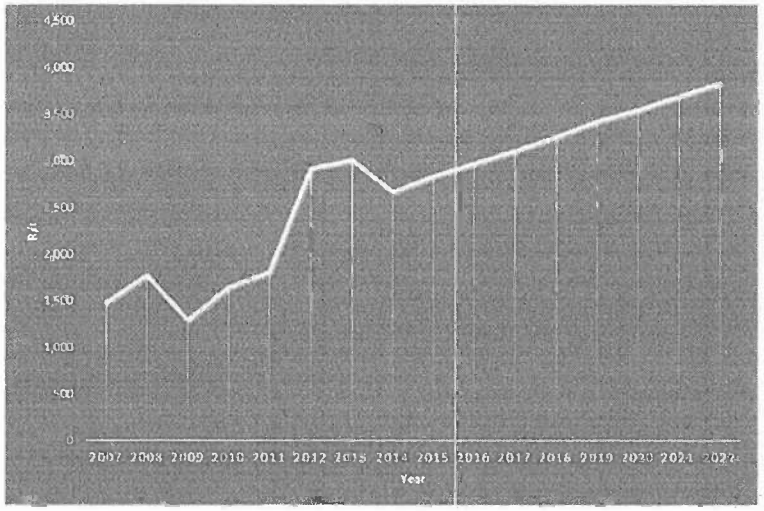
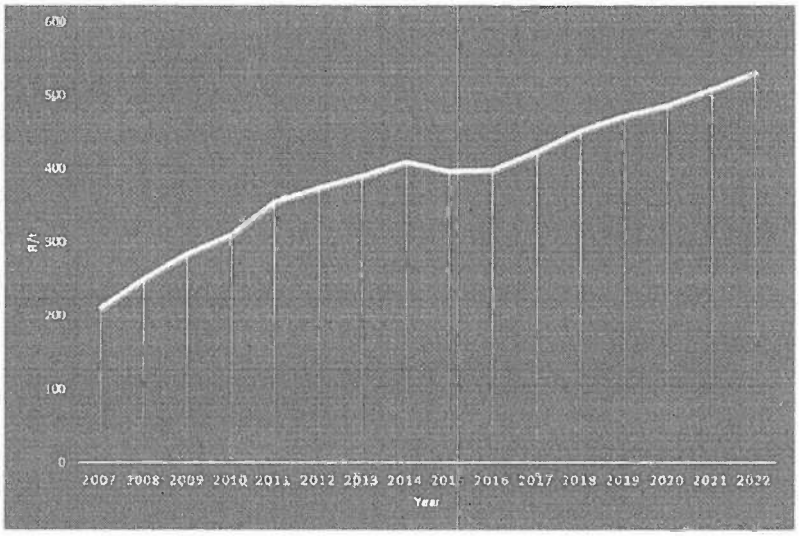


Figure 2: Sugarcane Price Forecasts (BFAP)



In addition, as the country moves towards the cost-reflective pricing of water it is likely that input cost pressure will be reflected in the price of sugarcane.

Apart from the current net raw material prices, sorghum production has greater potential benefits for job creation and small business development particularly in former homelands where the previously disadvantaged reside and farm on marginal agricultural lands. This speaks directly to the objectives of the Biofuels Industrial Strategy.

Therefore, sorghum should be the preferred reference feedstock over sugarcane. This is further justified by the fact that sorghum requires less water to produce and is suitable for dry land production unlike sugarcane which may require some form of irrigation even though currently only 125 000ha of the South African Sugar cane crop is under irrigation. According to the Agricultural Research Council (ARC), the absolute maximum total available agricultural land is 25 million hectares of which much is not available or of very low quality (8

million hectares being marginal and 7 million hectares being moderate). More than 80% of soils in South Africa are classified as having a moderate to low potential, showing that agricultural soils in South Africa are limited. However, there has been potential land identified in the Eastern Cape mostly in former homelands (about 3 million hectares) but production in the former homelands would support dry land production as there is lack of irrigation infrastructure. Given that South Africa is classified as a water-stressed country, incentivising sorghum production as a biofuel feedstock over sugarcane becomes justified as this is likely to have lesser demand on the current water resources hence consistent with the country's binding natural resources constraint. A summarised comparison of sorghum and sugarcane as bio-ethanol feedstock is provided in *Table 3* below:

Parameter	Sorghum	Sugarcane
Material requirements per m^3 ethanol	2.40 t	12.5 t
Water requirements for cultivation	Dry land	Both dry land and irrigation. Brownfields expansion on dry land is possible. New sugarcane (Greenfields) is likely to be irrigated.
Cultivation	Planted and harvested every year	Sugarcane harvested every year, growth cycle average 12 to 18 months, ratoon for 8 to 10 years
By-products	Medium protein distiller's grains, which can replace maize in animal feeds	Some additional renewable energy outputs if greenfield sugar mill such as renewable electricity.
Agricultural job creation potential @ 2% ethanol blending[3]	2,400 without multiplier effects	2,000 to 12,500 without multiplier effects depending on how the industry grows more sugarcane
Land area for 2% ethanol[4]	200,000 ha	30,000 to 50,000 ha
Global price volatility	Relatively stable, subject to global supply-demand dynamics	Relatively volatile, driven by export supply from Brazil

Table 3: A comparison of sorghum and sugarcane as bio-ethanol feedstock

6.4 Option 3: An entirely crop-neutral bidding process

This option seeks to depart from a focus on a specific reference crop as a feedstock for the manufacturing of biofuels. This would be achieved by soliciting bids, against criteria set by Government, from prospective manufacturers of biofuels along the lines of bidding under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

[3] Agricultural job assumptions: 1 job per 250 tonnes grain sorghum; 1 job per 240 tonnes additional sugarcane
[4] Yield assumptions: sorghum 3 t/ha; sugarcane 60 t/ha (dry land) and 100 t/ha irrigated

All bidders must be licensed manufactures of biofuels, noting however that being licensed does not guarantee subsidised offtake. This means that they must meet the DoE's licensing criteria to be considered in the bidding process. Bidders are then checked against cost effectiveness as well as other set criteria that Government may choose to apply (e.g. Broad Based Black Economic Empowerment level; number of jobs created; and project's demand on water and other resources). With respect to cost-effectiveness, bidders must (using a standard model) indicate the amount of subsidy they would require at different prices and the amount of subsidy "clawback" they would pay. This entails the bidder selecting a "floor price", which is a biofuels price below which it would need a subsidy. Similarly the bidder would select a "ceiling price", which is the price at which the manufacturer would make "give back" or "claw back" payments to Government. These payments would be determined by the difference between the "ceiling price" and the BFP for the month concerned.

Different bidders could, and are likely to, assume different BFP and feedstock price paths making it difficult to compare bids. To avoid this, Government should include in the bid documents its price path. For example, Government could get monthly price forecasts for twenty (20) years by three well-known professional forecasters and take the average of the three. Such forecast would have to take into account, among other factors, the Rand/USD exchange rate.

Although this option has some benefits, it is much more complex and requires a total review of the approach followed thus far. Hence it would delay the process without any guarantees of a superior end product. Hence it is deemed prudent that this option be foregone for the first phase of the implementation of the Biofuels Industrial Strategy but be fully explored for application in the subsequent phase(s).

6.5 Recommended Option

In view of the need to expedite the first phase of the implementation of the Biofuels Industrial Strategy, it is recommended that grain sorghum and soya beans should be the only reference feedstock for the manufacturing of bio-ethanol and biodiesel respectively. Notwithstanding concerns about unrelated commodity cycles between sugarcane and sorghum, the choice of sorghum and soya in determining the reference prices for the subsidy should not however deter biofuels manufacturers wanting to use other crops as feedstock. That is, a prospective biofuel manufacturer may still make an investment decision provided it is confident that its feedstock will be economically viable / profitable given the reference price. The non-exclusionary nature of the subsidy is premised on the basis that whoever wants to access the subsidy would first have to meet set criteria to qualify as a beneficiary.

However, a detailed evaluation of the rejected and other options needs to commence while Phase 1 is underway for implementation as soon as practicable in the context of proper monitoring and evaluation of the implementation of the Biofuels Industrial Strategy. With respect to sugarcane, a holistic approach which

considers opportunities arising from the production of sugar, cogeneration and biofuels should be pursued. Further engagements between Government, the sugar industry as well as other interested and affected parties are required in this regard.

7. CRITERIA FOR ELIGIBILITY FOR GOVERNMENT'S SUPPORT FOR MANUFACTURERS OF BIOFUELS

The set criteria for eligibility for Government's support for biofuels are premised on requiring individual biofuels projects to benefit the country at macro-economic level to justify their subsidisation.

7.1 Standards, criteria and indicators augmenting licensing

Noting the aforementioned link between the Bio-ethanol Blending Value and the concentration level of bio-ethanol in blended petrol, it is recommended that a distinctive set of criteria should be used to determine a biofuel manufacturing facility's eligibility for Government support. A separate set of criteria is also justified by the fact that there are already licensed biofuel manufacturers based on criteria that were applicable for licensing purposes. However, being licensed by the Office of the Controller of Petroleum Products under the Petroleum Pipelines Act, 1977 (Act No. 120 of 1977) should be the primary prerequisite.

Eligibility for the subsidy scheme will be on a first-come, first-served basis in terms of reaching the market with sellable product and with reference to actual production and not mere plant capacity. That is, the subsidy pay-outs will be based on actual litres of biofuels supplied for blending. For as long as the penetration remains below 2% the subsidy will be based on a 2% bio-ethanol concentration in blended petrol. Once the 2% penetration has been breached the subsidy level will consider the concentration to be 10%. The expected resultant increase (albeit small, ceteris paribus) in the subsidy would also help the late comers who will have a shorter period under the Subsidy Scheme. The Subsidy Scheme will be applied for a period of twenty (20) years form the start of providing financial support to the first manufacturer of biofuels. Government will review whether to increase the national penetration levels for biofuels beyond the 2% limit / target based on a cost-benefit analysis.

It is very difficult to make a prediction regarding the time it will take to reach the 2% penetration target. Considering the number of licensed entities and the fact that the Biofuels Pricing Mechanism will remove the main obstacle to biofuels production, it is fair to expect that the target will be achieved in the fourth year from the date of finalising the Biofuels Pricing Mechanism (Subsidy Scheme). This incorporates the fact that once the scheme is finalised and announced it will take about two years to construct the first manufacturing plants, which are not going to produce at their full capacity on their commissioning dates. It is expected that they will operate in their full capacities in the second year, with new ones also being commissioned.

Table 4 below outlines the principles or standards that should guide biofuel manufacturing facilities' eligibility for Government support, the associated criteria as well as the indicators for measuring the achievement or non-achievement of the set criteria. The tabulated list seeks to incorporate the objectives of the Biofuels Industrial Strategy and to provide checks and balances for ensuring sustainable biofuels production in line with the aforesaid SADC Framework.

STANDARDS	CRITERIA	INDICATORS
Contribution to liquid fuels industry transformation	Mandatory part ownership by historically disadvantaged South Africans (HDSAs)	A minimum of 25% ownership and control of biofuels manufacturing plants by HDSAs. All other matters related to transformation will be informed by BBBEE Act and other specific sectorial laws
Facilitation of social inclusion	Mandatory part sourcing of biofuels feedstock from small holder farmers, emerging farmers and other farming historically disadvantaged South Africans (HDSAs)	A combined minimum of 10% biofuels feedstock sourced from small holder farmers, emerging farmers and HDSAs within 4 years of start-up plant operations.
Protection of agricultural land rights	Prior written consent from land owners to participate in the biofuels programme	A legally sound consent form signed by the land owner
Positive contribution to rural development	Appointment of labour	Bio fuels manufacturer's feedstock supply contract must contain a clause stating that a minimum of 70% labour procured from the South African citizens (if available) appointed in agricultural activities
		A combined minimum of 10% unskilled, semi- and skilled labour procured from the South African citizens (if available) appointed in manufacturing plant
	Mandatory spend on rural SMMEs, Co-operatives and contribution to community initiatives	Percentage of the annual procurement spend of the manufacturing plant on local SMMEs, Co-operatives and community initiatives
		Type and quality of training afforded local SMMEs, Co-operatives and community members
Avoidance of food security threats	Prohibition of diverting commercial farmlands to biofuels feedstock production	Letter from the Department of Agriculture Forestry and Fisheries (DAFF) confirming the feedstock has been / will be planted in "Designated Areas" and not in currently productive commercial farmlands (save for land acquired through the land restitution and other redress programmes)

STANDARDS	CRITERIA	INDICATORS
Protection of scarce natural resources	Avoidance of deforestation	The supply contract shall contain a clause that stipulates a prohibition of clearing of trees (and indigenous trees in particular) for feedstock production unless agreed to in writing by relevant authorities e.g. the Department of Water Affairs (DWA) & DAFF, etc.
	Controlled biofuel feedstock irrigation	Letter from DWA approving the use of irrigation water for biofuel feedstock production
		Detailed motivation for irrigating biofuel feedstock without negatively impacting the country's constrained water resources
Ability to produce sustainably	Demonstrate the commitment to establish a biofuels plant and be financially sustainable (continue as a going concern)	A EIA Record of Decision must be in place Letters of intent/MOUs from debt and equity funders to be provided covering the full investment Summary business plan to be provided

Table 4: Standards, Criteria and Indicators

7.2 Eligibility criteria – General Guiding principles

In order to reduce regulatory burden on the part of potential players and to streamline Government processes, the criteria for a manufacturer of biofuels to be eligible to be a beneficiary under the Government's subsidy scheme should be administered and communicated to stakeholders by the Office of the Controller of Petroleum Products.

For a manufacturer of biofuels to be eligible as a beneficiary under the Government's subsidy scheme, such a manufacturer must-

- be licensed in terms of the Petroleum Products Act, 1977 (Act No. 120 of 1977), as amended; and
- comply with all the criteria in *Table 4* above and be the first to market until the cut off point for the first phase, i.e. 2% by volume biofuels blending in the national fuel pool. Should a number of manufacturers come on-stream simultaneously they will be scored on a relative scale against the criteria in *Table 4* above.

In order to accommodate as many players as possible in the biofuels industry, the maximum annual volume that will qualify for incentives per manufacturer will be capped to the most efficient plant capacity assumed in the Biofuels Pricing Reference Models: For bio-ethanol, it is 158,000 cubic metres per annum (m^3/a); and for biodiesel, it is 100,000 tonnes per annum or 113,600 m^3/a. A biofuels manufacturer may establish a plant capacity in excess of the volumes above, but the volumes that qualify for incentives will be capped as afore-indicated.

Where profits are in excess of 20% ROA in terms of the models used in the Biofuels Pricing Model, the excess portion of such profits should be paid back into the fiscus.

The eligibility for subsidisation of a manufacturer may be terminated if there is reasonable proof that the manufacturer has failed to meet his/her obligations as promised or undertaken.

7.3 Review of the eligibility criteria

The Criteria will be reviewed from time to time in line with changes in the industry landscape as well as the environmental and socio-economic needs of the country. There will however be a revision of the design of the subsidy mechanism at penetration levels above 2% to include stricter criteria for food and water security as well as environmental impacts.

8. ADMINISTRATION OF THE COLLECTION AND DISBURSEMENT OF THE MONIES

It has been deemed prudent that the biofuels levy imposed on all sales of petrol and diesel in the republic be collected as part of the General Fuel Levy. The levy would then be disbursed by the DoE to the eligible manufacturers of biofuels.

The biofuels levy is a proposed additional fuel levy to be implemented into the diesel and petrol price structures. This will be applicable on all diesel and petrol consumed locally. The levy will be imposed in terms of the Customs and Excise Act, No. 91 of 1964. It is likely to be imposed in an estimated range of 4.5 to 6.5 cents per litre on all petrol and diesel sold for domestic consumption in South Africa. The levy will apply for a 20-year period to subsidise biofuels manufacturers and help establish the infant industry. A 2% blending requirement will apply for the First Phase, after which a decision will be made on the basis of a cost benefit analysis as to whether to increase the 2% penetration level. This decision will be an integral part of the normal monitoring and evaluation of implementation of the Biofuels Industrial Strategy. SARS would be the collection agent through its existing Duty at Source (DAS) fuel levy administration systems and would deposit proceeds into the National Revenue Fund. The funds will then be appropriated on the DoE's annual budget as part of the budget process.

While the subsidy is envisioned to require a monthly adjustment mechanism, the general fuel levy updates will still be done annually. The Adjusted Budgets process will be used to amend the allocations to cover any shortfalls in the event of substantive differences between the actual price and the estimated price at the beginning of the financial year. The DoE will make subsidy payments to qualifying biofuels producers on a monthly basis.

For those biodiesel producers that are part of the new subsidy scheme and supply biodiesel for blending, the diesel fuel tax rebate will be zero as they will qualify for the subsidy. All their biodiesel will be blended and the blended fuel will then be subject to all the fuel taxes. The lower fuel tax for biodiesel (rebate) will still apply for those biodiesel producers that are not part of the new subsidy scheme.

Annexure E

WORKING RULES TO DETERMINE THE MONTHLY BIOFUELS TRANSFER PRICES AND LEVELS OF INCENTIVES FOR BIOFUELS MANUFACTURERS

1. Working Rules to Determine the Monthly Transfer Price of Biodiesel and Bio-ethanol

1.1. To determine the **monthly** biodiesel and bio-ethanol transfer prices, a Biofuels Economic Model is used. The current version is "Revised Biofuels Model rev1.1 June 2013".

1.2. The "User inputs" sheet must be updated on a monthly and annual basis.

1.3. The monthly "user inputs" are:

1.3.1 the Basic Fuels Price (BFP) of 50 ppm sulphur diesel as determined on a monthly basis in terms of the Working Rules to administer the Basic Fuels Price (BFP) and which is, if necessary, adjusted on a monthly basis on the first Wednesday of each month;

1.3.2 the Basic Fuels Price (BFP) of 95 Unleaded petrol as determined on a monthly basis in terms of the Working Rules to administer the Basic Fuels Price (BFP) and which is, if necessary, adjusted on a monthly basis on the first Wednesday of each month;

1.3.3 SAFEX soya futures price (nearest contract);

1.3.4 SAFEX yellow maize futures price (nearest contract);

1.3.5 SAFEX sorghum futures price (nearest contract); and

1.3.6 the month number, where the month in which mandatory biofuels blending becomes effective is month 1

1.4 The annual "User inputs" are:

1.4.1 The year-on-year consumer price index inflation (CPI);

1.4.2 The year-on-year producer price index inflation (PPI); and

1.4.3 The annual sales of petrol in South Africa in the preceding year.

1.5 In addition, the following should be specified to calculate the "Bio-ethanol Blending Value", and updated periodically as appropriate:

1.5.1 Target ethanol blending percentage;

1.5.2 Petrol-alcohol mix specifications;

1.5.3 Blending configuration; and

1.5.4 Additives.

2. Source and Determination of User Inputs

2.1 The BFP to be used must be determined as follows:

2.1.1 Obtain the daily BFP of 50 ppm sulphur diesel from the Central Energy Fund (Pty) Ltd for each working day of a calendar month;

2.1.2 Add the daily BFP numbers and divide by the number of working days to determine the BFP to be used in the following calendar month;

2.1.3 Insert this value in c/l into the Excel spreadsheet (see *Figure 1*);

2.1.4 Obtain the daily BFP of 95 Unleaded Petrol from the Central Energy Fund (Pty) Ltd for each working day of a calendar month;

2.1.5 Add the daily BFP numbers and divide by the number of working days to determine the BFP to be used in the following calendar month; and

2.1.6 Insert this value in c/l into the Excel spreadsheet (see *Figure 1*).

Figure 1: Inputs for Monthly Petrol and Diesel BFP (in Yellow)

USER INPUTS

ECONOMIC DATA	Historic Data								
	2010								
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	FY	Jan
Month number		1	2	3	4	5	6	7		8
PPI		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CPI		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
BFP unleaded petrol 95, c/l		444.81	422.63	420.74	404.56	399.49	413.00	425.84	418.72	453.95
BFP ultra low sulphur diesel, c/l		463.93	446.04	439.96	435.58	430.16	439.62	454.32	444.23	477.03
SAFEX yellow maize price, R/t		1,110.05	1,148.64	1,254.18	1,369.55	1,383.81	1,586.45	1,412.17	1,323.55	1,478.81
SAFEX sorghum, R/t		1,421.14	1,555.91	1,572.77	1,667.95	1,709.52	1,700.00	1,741.74	1,624.15	1,760.24
SAFEX soya, R/t		2,544.05	2,780.86	3,057.27	3,238.82	3,199.62	3,367.41	3,366.13	3,079.17	3,658.57
Annual sales of petrol in prior year, (billion of litres)		11.93	11.93	11.93	11.93	11.93	11.93	11.93	11.93	12.21

2.2 The South African Futures Exchange (SAFEX) prices for soya, yellow maize and sorghum must be obtained from SAFEX's website on a monthly basis.

2.2.1 The mark-to-market (MTM) futures prices of the nearest month contract must be used for each commodity;

2.2.2 Obtain the daily futures price for each working day of a calendar month;

2.2.3 Add the daily SAFEX prices and divide by the number of working days to determine the SAFEX prices to be used in the following calendar month; and

2.2.4 Insert these values in R/t into the Excel spreadsheet (see *Figure 2*).

Figure 2: Inputs for Monthly SAFEX Prices (in Yellow)

USER INPUTS

ECONOMIC DATA	Historic Data								
	2010								
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	FY	Jan
Month number		1	2	3	4	5	6	7		8
PPI		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CPI		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
BFP unleaded petrol 95, c/l		444.81	422.63	420.74	404.56	399.49	413.00	425.84	418.72	453.95
BFP ultra low sulphur diesel, c/l		463.93	446.04	439.96	435.58	430.16	439.62	454.32	444.23	477.03
SAFEX yellow maize price, R/t		1,110.05	1,148.64	1,254.18	1,369.55	1,383.81	1,586.45	1,412.17	1,323.55	1,478.81
SAFEX sorghum, R/t		1,421.14	1,555.91	1,572.77	1,667.95	1,709.52	1,700.00	1,741.74	1,624.15	1,760.24
SAFEX soya, R/t		2,544.05	2,780.86	3,057.27	3,238.82	3,199.62	3,367.41	3,366.13	3,079.17	3,658.57
Annual sales of petrol in prior year, (billion of litres)		11.93	11.93	11.93	11.93	11.93	11.93	11.93	11.93	12.21

2.3 Obtain the monthly PPI from the South African Statistical Services. During January each year the PPI published by the South African Statistical Services will be available up to November of the previous year. Determine the PPI increases for the previous twelve months, which is from December of the second last year to November of the previous year and insert the value in percentage into the Excel model (see *Figure 3*).

2.4 Obtain the monthly CPI from the South African Statistical Services. During January each year the CPI published by the South African Statistical Services will be available up to November of the previous year. Determine the CPI increases for the previous twelve months, that is from December of the second last year to November of the previous year and insert the value in percentage into the Excel model (see *Figure 3*).

2.5 Obtain the annual sales of petrol in South Africa for the previous year from ..... and insert the value in billions of litres in the Excel model (see *Figure 3*).

Figure 3: Inputs for Annual PPI, CPI and Sales of Petrol (in Yellow)

USER INPUTS

ECONOMIC DATA	Historic Data								
	2010								
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	FY	Jan
Month number		1	2	3	4	5	6	7		8
PPI		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CPI		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
BFP unleaded petrol 95, c/l		444.81	422.63	420.74	404.56	399.49	413.00	425.84	418.72	453.95
BFP ultra low sulphur diesel, c/l		463.93	446.04	439.96	435.58	430.16	439.62	454.32	444.23	477.03
SAFEX yellow maize price, R/t		1,110.05	1,148.64	1,254.18	1,369.55	1,383.81	1,586.45	1,412.17	1,323.55	1,478.81
SAFEX sorghum, R/t		1,421.14	1,555.91	1,572.77	1,667.95	1,709.52	1,700.00	1,741.74	1,624.15	1,760.24
SAFEX soya, R/t		2,544.05	2,780.86	3,057.27	3,238.82	3,199.62	3,367.41	3,366.13	3,079.17	3,658.57
Annual sales of petrol in prior year, (billion of litres)		11.93	11.93	11.93	11.93	11.93	11.93	11.93	11.93	12.21

3. Model Outputs for Transfer Prices and Levels on Incentives for Biofuel Manufacturers

3.1 All the relevant outputs from the model are contained in the "Summary" sheet (see *Figure 4*).

3.2 The transfer price of biodiesel in c/l is the BFP of 50 ppm sulphur diesel as determined in steps 2.1.1 to 2.1.3.

3.3 The transfer price of bio-ethanol in c/l is the BFP of 95 Unleaded Petrol as determined in steps 2.1.4 to 2.1.6, plus the Blending Value fixed cost element, plus the Blending Value variable cost element. The transfer price value is provided in the Summary spreadsheet.

3.4 The level of incentive in c/l of biofuel for biodiesel and bio-ethanol is calculated by the economic model in order to achieve a ROA of 15% for the hypothetical reference plants. The Summary spreadsheet provides the Biodiesel/Bio-ethanol incentive paid to/by manufacturer. Positive values are paid to the biofuel manufacturer from the Fund administering the scheme when the calculated ROA is less than 15%. Negative values are paid by the manufacturer to the Fund administering the scheme when the calculated ROA exceeds 20% (claw-back of 25% of the calculated earnings in excess of 20%).

Figure 4: Outputs of Biodiesel and Bio-ethanol Transfer Prices and Incentives

SUMMARY

		Historic Data								
		2010								
		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	FY	Jan
	Unit									
Month Number			1	2	3	4	5	6	7		8
BFP ULP95	c/l		444.81	422.63	420.74	404.56	399.49	413.00	425.84	418.72	453.95
Blending Value fixed cost element	c/l		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blending Value variable cost element	c/l		22.24	21.13	21.04	20.23	19.97	20.65	21.29	20.94	22.70
Total Blending Value	c/l		22.24	21.13	21.04	20.23	19.97	20.65	21.29	20.94	22.70
Bioethanol Transfer Price	c/l		467.05	443.76	441.77	424.79	419.46	433.65	447.13	439.66	476.65
Bioethanol ROA	%		-2.7%	-6.5%	-6.7%	-9.2%	-10.3%	-8.5%	-8.8%	-4.4%	-6.8%
Calculated Bioethanol Producer Incentive	c/l		253.44	305.91	306.68	340.37	354.07	328.82	332.14	317.35	304.38
Bioethanol Incentive paid TO/BY manufacturer *	c/l		253.44	305.91	306.68	340.37	354.07	328.82	332.14	317.35	304.38
Biodiesel Transfer Price	c/l		463.93	446.04	439.96	425.58	430.16	439.62	454.32	444.23	477.05
Biodiesel ROA	%		5.8%	2.7%	0.2%	-1.4%	-1.5%	-2.0%	-0.9%	0.2%	-1.2%
Calculated Biodiesel Producer Incentive	c/l		118.37	159.81	193.94	216.53	217.05	224.78	209.78	191.47	217.69
Biodiesel Incentive paid TO/BY manufacturer *	c/l		118.37	159.81	193.94	216.53	217.05	224.78	209.78	191.47	217.69