

# Biofuels Industrial Strategy of the Republic of South Africa

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# BIOFUELS INDUSTRIAL STRATEGY

## 1 Executive Summary

This document presents the proposed South African Biofuels Industrial Strategy and outlines Government's approach to policy, regulations and incentives. This is a refinement of the draft Strategy approved by Cabinet for public comments in December 2006. The changes are based on comments received from wide range of stakeholders. The stakeholders' comments covered areas such as water limitations, food security (availability and affordability), land prices and land restitution, environmental concerns, biofuels quality, technology choices, crop selection/choices, support and incentives and concerns that strategy/policy is taking too long to be finalized.

The draft Strategy was developed by the Biofuels Task Team that was appointed by Cabinet in December 2005 with a mandate to develop a national Biofuels Industrial Strategy targeted at creating jobs in the energy-crop and biofuels value chain, and to act as a bridge between the first and second economy.

A significant change to the draft Strategy is to adopt a short term focus (5 year pilot) to achieve a 2% penetration level of biofuels in the national liquid fuel supply, or 400 million litres pa. The target has been revised down from the 4.5% target that was initially proposed in the draft Strategy document. The following crops are proposed for the production of biofuels in the country, Bioethanol sugar cane and sugar beet, for Biodiesel sunflower, canola and soya beans. The exclusion of other crops and plants such as maize, jatropha is based on the food security concerns and that further research still need to be done to test usability of these in the country.

The 2% level can be achieved without jeopardising food security it will focus on new and additional land and that the strategy proposes that basic food crops be excluded in the initial stages. This will require about 1.4% of arable land in South Africa. Currently 14% of arable land, mainly in the former homelands, is underutilised. The producer (investor) incentive

should only be allocated to projects that involve expansion that will assist in achieving the 2% target. This will ensure job creation, expanded agricultural production, and increased food supply. In the case of an extreme drought and crop failures, a certain percentage of feedstock on the additional agricultural land maybe redirected to the food market to address shortages. In terms of the first and second economy trajectory government will have to support the development of the underutilised land to a level that will compete commercially. The farmers in these underdeveloped land will be encouraged through cooperatives (where possible) to participate in the running of biofuels refineries.

The existing fuel levy exemption, for biodiesel that is a product (as opposed to producer) incentive should continue.

- Biodiesel currently enjoys a 40% fuel levy exemption. It is proposed that once the Strategy is approved, this levy exemption should be increased to 50% from 2008/9 financial year. Thereafter the percentage will remain the same but the absolute value of the support will increase with any increases in the fuel levy. It is impractical to increase the exemption beyond 50% due to the impact of the current diesel tax refund scheme.
- A 100 % fuel tax exemption is proposed to continue for bioethanol, as it can also be used in markets other than petrol e.g. ethanol gel that competes with illuminating paraffin. Illuminating paraffin carries no levies.

The producer support mechanism will be used to balance the difference in fuel tax support to bioethanol and biodiesel, by setting a fixed margin price. A 100% petrol tax exemption amounts to an effective support of R1.21 per litre, whereas a 50% diesel fuel levy exemption amounts to an effective support of R0.53 per litre. The support to bioethanol as a product is thus 68 cents per litre higher than diesel. The proosed support during the initial stages should assist the investors to achieve a reasonable return on investments.

To reduce project risk, related to feedstock provision, further support to the farmers and particularly communities living on the underutilised land will be needed. This can be done through existing agricultural support programmes as well as from support of investments that the project makes in agricultural development.

# **1 Introduction**

## **1.1 Purpose**

Internationally, the growth of the biofuels industry has been driven by a number of factors which includes: the support for renewable energy, support for cleaner and environmentally friendly energy sources in a bid to limit global warming; upliftment of the agricultural sector (through utilisation of surplus agricultural land to produce products in excess of food needs); promotion sustainable development, exertion of downward pressure on global crude oil prices and the need to improve energy security. The biofuels programme has the potential to uplift agricultural sectors and to unlock substantial economic benefits in sub-Saharan Africa, South America and other developing regions, in particular by:

- Attracting investment into rural areas;
- Promoting agricultural development;
- Import substitution of foreign oil with balance of payment savings; and
- Overcoming the trade distorting effects that South Africa, African subcontinent and other developing countries have faced overtime because of subsidised agricultural production in developed countries.

In South African, a specific requirement of the Biofuels Strategy was to create a link between the first and second economies. This requirement entailed creating jobs in under-developed areas, such as in the former homelands, where agriculture was undermined by the apartheid system.

Clear government policy regulations and incentives are a prerequisite for the development of the biofuels industry. This is particularly due to the volatile nature of oil product prices with which biofuels must compete, this is a similar scenario to that experienced by South Africa during the development of the synthetic fuel industry.

## **1.2 Background**

This section traces chronologically the development of Government policy on energy (including renewable energy and biofuels) and sustainable development that gave impetus for the development of a biofuels industry in the country.

- **1998** – The White Paper on Energy Policy set the country's energy policy and acknowledged the importance of alternate transport fuels and a diversified energy supply mix.
- **May 2001** – Department of Arts, Culture, Science and Technology completed a Technology Audit of the Transport Fuels Sector, which concludes that the largest energy saving potential lies in improving vehicle efficiencies; that biofuels need more investigation; and that the level of government support should be determined.
- **2002** – South Africa hosted the World Summit on Sustainable Development (WSSD). The outcome of the WSSD was the Johannesburg Plan of Implementation (JPol), which commits South Africa to developing renewable energy technologies, including biofuels.
- **2003** – The White Paper on Renewable Energy sets a renewable-energy target of 10 000 GWh (equivalent to 0.8 Mtoe) to be achieved by 2013. In South Africa, transport fuels make up 30% of energy consumption (by energy content) and 70% (by value), therefore the transport sector is an important energy sector to consider the development of renewable energy sources and technologies.
- **2003** – The Petroleum Products Amendment Act, (Act No. 58 of 2004), authorises the Minister of Minerals and Energy to require licensed liquid fuel wholesalers and producers to supply and sell petroleum products made from “vegetable matter”. This is an important legislative vehicle for the biofuels development in the country.
- **16 February 2005** – The United Nations Framework Convention on Climate Change (UNFCCC) and its related Kyoto Protocol comes into effect. The Kyoto Protocol obliges industrialised countries (known as “Annex 1 countries”) to reduce their greenhouse gas emissions by at least 5% compared to 1990 levels over 2008 to 2012, primarily by investing in cleaner technologies in developing countries. South Africa acceded to the Kyoto Protocol in March 2002. Although the Kyoto Protocol does not commit the non-Annex 1 countries (like South Africa) to any quantifiable emission targets, there is potential for future, low-cost emission reduction options in these countries. The Clean Development Mechanism (CDM) provides for trade in certified emission reductions

(CERs) between non-Annex 1 countries and Annex 1 countries and thus supports sustainable development with respect to greenhouse-gas emissions reduction in developing countries at the same time it helps Annex 1 countries to comply with their Kyoto Protocol commitments. Biofuels projects may apply for carbon emission reduction credits via mechanisms such as fuel switching.

- **2005** – National Treasury approved the increase of the Fuel Levy exemption for biodiesel from 30% to 40%. The exemption was introduced in 2003. SARS allows for 100% exemption for small biodiesel producers (less than 300 m<sup>3</sup> annually). Biofuels investments also qualify for a tax-depreciation write-off of 50:30:20 percent over three years. This equates to support of about 10 cpl.
- 2005 - A DST lead Bio-diesel Joint Implementation Committee conducted a detailed examination and concluded that government supported biodiesel production can be justified due to its environmental and socio-economic benefits.
- **July 2005** – National Treasury released a Discussion Paper on Environmental Taxes, which proposes an extension of the fuel levy exemption incentive to bioethanol, and that the basis for incentives should be linked to externality benefits.
- **September 2005** – National Treasury approved a Renewable Energy Capital Subsidy Scheme administered by the DME. In 2006/7, the Subsidy provides for 16.7 c/l subsidy for bioethanol and 27.3 c/l for biodiesel, up to a maximum of R 20 million. However, cost competitive world scale projects typical require typically an investment in the order of R1 billion. Effectively this proposed support amounts to 2% of the required investments.
- 2006 – The DST supports the South African Bureau of Standards to develop the required analytical and technical capacity to perform bio-fuels analysis.
- **2006** – The Cleaner Fuels Programme phases-out leaded petrol and reduces sulphur in diesel to a maximum of 0,05% (mass). Regulations gazetted under the Petroleum Products Amendment Act in June 2006 in support of this programme include a specific allowance for biodiesel addition and mandates fuel specifications according to South African National Standards (SANS). SANS has finalised specifications for biodiesel and

fuel ethanol, and is developing a standard for ethanol gel fuel. The standards are in line with European, USA and Japanese standards, and these countries were selected because the automotive industry is dominated by manufacturers from these markets. The revision of standards and their deployment fits in with the measures proposed in this document, which will enhance the development of cleaner fuels into the South African petroleum pool.

- **November 2006** –A draft National Biofuels Strategy is submitted to Cabinet, and subsequently issued for public comment until May 2007. This document reflects the changes made to that draft Strategy based on the BTT's analysis of stakeholder comments and inputs.

## **2 Objectives of this Strategy**

The National Biofuels Industrial Strategy is driven predominantly by the need to address issues of poverty and economic development. The focus of the Strategy therefore will be the promotion of farming in areas that were previously neglected by the apartheid system and areas of the country that did not have market access for their produce, most of these areas are in the former homeland areas. The strategy is also aimed at creating a development balance between previously disadvantaged farming areas and commercial farming areas. This will ensure the sustainable development of the biofuels industry in the country as it looks both at producing commercial agricultural areas and also providing firm opportunities for new and emerging farmers. The Strategy seeks to stimulate rural development and to reduce poverty by creating sustainable income-earning opportunities. Biofuels plant investment can be a catalyst for the transformation of rural economies and contribute to the government's Accelerated Shared Growth Initiative (AsgiSA).

Furthermore, biofuels also contribute towards the achievement of the renewable energy goals; energy security and the reduction of greenhouse gas emissions. The Feasibility Study underpinning this strategy included an analysis that considered all these factors and the impact of all these factors.

Biofuels industry will support a variety of national priorities, including job creation, sustainable development and Black Economic Empowerment and thus prioritising these benefits in the Strategy enables regulations and incentives to be optimised

### **3 Feasibility Study Findings**

The extent of Government support and the location of the biofuels plants will determine the ultimate size of the biofuels industry. Government support must be justified by maximising benefits and minimising costs and unintended consequences.

As a part of the Feasibility Study, a comprehensive and integrated model was developed to determine likely and optimum scenarios. From these scenarios, benefits, costs and risks were identified.

Biofuels supply requires low-cost, high-yield and surplus agricultural production, generally not destined for food consumption, as well as government support, particularly when crude oil prices are low. South Africa has limited arable land, only 14% of the total land available. About 10% of this land is irrigated, consuming 60% of the national water supply. However, in most years South Africa has surplus crop production, each of which could generate sufficient ethanol to meet 5% of national petrol demand. In addition, there are 3 million hectares of underutilised, high potential land, mainly in the former homelands. Utilising 1 mil ha of such land could produce biofuels representing about 5% of national diesel usage.

The Feasibility Study determined that production would vary regionally according to climate and soil characteristics and that co-product markets would limit biofuels capacity and affect costs. An achievable production level from surplus crops and underutilised land equates to 4.5% of national petrol and diesel volumes.

The proposed initial 2% biofuels penetration that will have a producer support scheme requires the use of local crops grown mainly on currently underutilised land in the former homelands and support from the commercial land. The 2% biofuels scenario will create 25 000 jobs. . The capital spend per job created is about 65% less than the Industrial Development Corporation target. This will reduce unemployment by 0,6% (mainly in rural areas); boost economic growth by 0.05% (or 2.5% of the AsgiSA target increase); achieve a balance of payments saving of R

1.7 billion; and a greenhouse gas emissions saving of R 100 million per annum. To reach this percentage biofuels penetration, will require investments of about R 4 billion over the 5 year period. The creation of this new industry would require a favourable investment climate. The jobs-to-investment ratio is about 100 times higher than for crude oil refineries. South African motorists and consumers have in the past supported the investment and operation of oil refining, in addition to ensuring the viability of the synthetic fuels industry by sheltering it from low oil prices, specifically incorporating a reasonable return on capital support scheme, for fuel wholesaling that produces minimal jobs, forex savings, economic growth and environmental benefits.

#### **4 Current Situation**

South Africa used bioethanol from sugarcane in petrol from the 1920's until the 1960's, when this fell away due to low international crude oil prices. Recent high oil prices and climate change considerations have led to major national and international interest in investing in biofuels production.

A number of potential investors have expressed interest in biofuels development. Some sugar industry players are already producing bioethanol for the potable and export alcohol markets and are developing fuel ethanol capacity in neighbouring countries. Some maize growers, in collaboration with private investors, have announced their intention to build several maize-to-ethanol factories. This has faltered due to uncertainty over regulations and incentives and due to the significant increase in local and world maize prices. The maize price increase has occurred largely due to the USA, which produces about 50% of world traded maize, diverting 25% of its crop to ethanol production, as well as to the phasing down of agricultural export support. Similarly, world oilseed and oil prices have increased significantly due to higher oil prices coupled with bio-diesel demand and incentives in many developed nations, particularly in the USA and the EU. Many foreign companies have examined biodiesel production as part of their arms deal offset obligations. The global maize price increases and the shortage of basic food stuffs in Mexico, which were directly linked to biofuels investments, has influenced South Africa to exclude maize use in its initial stages of biofuels development.

## 5 International Situation

The demand for biofuels, internationally, is spurred on by higher oil prices and government targets (mandates) and incentives. The leading ethanol producers are Brazil and the USA. Brazil has been producing ethanol from sugarcane since the 1970's. It meets about 20% of their liquid fuel demand, Brazil's national ethanol consumption is about 1.5 times higher than South Africa's demand. Brazil is increasing capacity and aims to achieve a 50% ethanol contribution to liquid fuels supply and they are working on a Biodiesel program. For Brazil, ethanol production is viable at an oil price of \$45/bbl. However, this includes a renewable electricity co-generation incentive of about \$10/bbl, from sugar bagasse. In addition, electricity costs are significantly higher than South Africa's, and this equates to an effective support of a further \$10/bbl and to put South African ethanol producers on the same footing would require a \$20/bbl higher oil price than applies in Brazil, or about \$65/bbl. \$20/bbl roughly equates to SA 100 cpl support to ethanol.

The Brazilian experience indicates that the renewable energy benefit will be derived from the ethanol and electricity produced from sugar bagasse. The sugar based Bioethanol production industry has a positive energy balance, as it generates its own energy needs, without an additional burden on the national grid. The USA produces ethanol from maize supported by incentives of up to R2 per litre (ca \$40/bbl). The EU recently reached a 2005 biofuels target of 2% of road transport fuel usage and has set a target of 5.75% by 2010 on the back of fuel levy exemptions amounting to \$80/bbl (SA 400 cpl). The energy balance of generating Bioethanol from maize is negative, because this industry does not generate its own energy.

Contrasted with South Africa, it is important to note that Brazil has abundant agricultural potential and in the USA farmers get huge subsidies and the feedstock used is not staple food crop.

The success of biofuels varies from country to country and largely depends on government support, however long term investments and increased efficiency have proved important in Brazil's case. Germany, the largest user of biodiesel, is now reducing its incentives, to reduce loss to the fiscus, and is moving to a mandatory target. This approach has problems as fuel off takers will only buy until the annual mandate is reached. If mandates are fulfilled early in the year, then any additional biofuels produce could lose the market.

Comparative analysis of international experience that the biofuels industry particularly as an infant industry is at the mercy of volatile oil prices, crop prices and exchange rates, therefore it requires government support at the initial stages.

## **6 Issues Involved**

The Biofuels Industrial Strategy is premised on the development of partnerships along the value chain and across the affected sectors. Firstly, the Strategy envisages a creation of a reliable market for fuels from biological sources and the fuels market. Biofuels can be used as blending components in both petrol and diesel production, the proposed blend ratio for South Africa is B2 or 2% biodiesel and E8 or 8% Bioethanol blend.. In the case of petrol, bio-ethanol can substitute a number of octane boosters currently used by the oil industry and biodiesel used by the synthetic fuels producers and other producers to a blending stock.

Secondly, the Strategy is premised on the pegging of the sales price of bio-ethanol and biodiesel as blending components at a price that covers the costs associated with running a biofuels plant<sup>1</sup>, agricultural feedstock and of transportation. It is expected that farmers that will be supplying the biofuels plant with feedstock, emerging farmers could organise themselves into cooperatives to maximise benefits and market power, participate either fully or partially in the ownership of the biofuels plant. The Strategy with its focus on rural development envisages that contracts will be signed between farmers' cooperatives and individual biofuels producer; this is currently done in the Sugar Industry. The contracts will facilitate sourcing of funding from relevant funding institutions such as the Land Bank and guarantees feedstock supply for the number of years in the contract.

Thirdly, it is expected that the cost of biofuels will be ring fenced, and remunerated separately. This is because biofuels will be blended at wholesale level. The cost to the motorist will be equivalent to \$65/bbl crude based refined products and therefore present a benefit, although limited to only 2%, if the price of crude oil stays above \$65/bbl.

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<sup>1</sup> The costs will include an allowance for a return on the installed capital that is commensurate with the risk. This return will be determined in the same way as the revised margin setting approach used to set petroleum products wholesale margins. The margin be fixed for a period but reviewed on a regular period as per an agreed formula.

Fourthly, and perhaps most importantly, the mandate for the development of the biofuels industry was clear, namely: *“Bio-Fuels a key driver in AsgiSA, for socio- economic development. Cabinet, on 7 December 2005, approved the development of an industrial strategy targeted at **creating jobs in the energy crops** and bio-fuels value chain **acting as a bridge from the second economy to first economy status.**”* It is in this regard that development of the industry based on imported feedstock has not been supported. This can only be supported at times of adverse agricultural production and at times when local producers cannot meet the investors demand.

Lastly, the Strategy targets areas of South Africa that are worst hit by poverty and deprivation. It hopes to generate economic activity, mainly, in the former homelands. Furthermore, only agricultural products grown in the previous homelands by historically disadvantaged farmers will qualify for the support. Only biofuels plants that have been identified to assist achieve the initial target will be supported and their location will be a condition of the issuing of a manufacturing licence. The plants will be located all over the country depending on the investor's choices and also as per the conditions of licences.

## **6.1 Agriculture**

Biofuels development in South Africa is about rural development and it is about the provision of opportunities to the rural poor by creating a market for their produce that would otherwise not be there.

In addition to the international oil price, which largely determines biofuels prices, the viability of the biofuels industry is largely a function of the cost of agricultural feedstock, which is typically 70% of total costs. Operating costs and capital payback are each about 15%. The specific projects and their associated crops will be determined by factors such as land availability and productivity and the agricultural products market. The biofuels industry impacts positively on the agricultural value chain providing better off-take or demand security, which can also stimulate better land productivity.

Internationally, biofuels production is used to support local farmers, and European biofuels production requires massive subsidies to match existing agricultural subsidies. In South Africa, this is not envisaged because apart from sugarcane, which has a floor price – agricultural subsidies are limited. Thus the support to develop feedstock supply will be achieved by

targeting existing agricultural support programmes such as Comprehensive Agricultural Support Programme (CASP) of DoA to assist biofuels investments by increasing production. CASP will prioritize those aspects of production that will enhance effective cropping for biofuels. Over time, the budget for CASP is increasing steadily, which will enable more farmers to be involved. If underutilised areas are prioritised for feedstock production, then CASP will be in line to enhance that priority. Other sources of support from provincial departments of agriculture will be supplemented by CASP.

The Grain Strategy has one of its objectives as to address the drop in the production areas based on availability of markets. The challenge that the Grain Industry has come across is the dropping of prices due to the increase in supply that was not met by the demand. This led to most farmers producing less and a lot of agricultural land lying fallow hence the grain strategy will assist in food security challenges that might be brought by the development of Biofuels Industry national and international.

## **6.2 Food Security**

The development of a modest biofuels sector, which targets underutilised land in former homelands, should have a minimal impact on both food security and prices. Currently 14% of arable land is under-utilised, and most of it is in the former homelands. These areas lack market access which biofuels plants will provide and infrastructure that agricultural and infrastructural support programmes should provide. Specifically the 2% level of biofuels proposed for support for the incubation phase will not compromise existing food markets, as this target can be achieved with about 300 000 ha of land about 1.4% of national arable land.

The main concern regarding food security revolves around the use of maize for ethanol production and It is for this reason that it has been proposed that the use of maize to produce bio-ethanol will be excluded at the initial phases of the strategy. It is envisaged that bio-ethanol production from maize will only be considered once certainty on the ability of the currently underutilised land to produce has been ascertained and the necessary measures are in place to guard against extreme (industry linked) food inflation. It is however believed that almost all of the previous productive lands in the homelands can be brought back into full production once a firm market for the produce has been secured. To specifically ensure the use of

underutilised land from the former homelands, a fixed margin scheme will only apply to litres produced from feedstock grown on this underutilised land.

### **6.3 Animal Feed**

Biofuels production will also contribute to food security by increasing the availability of by-products that can be used for animal feed. These include protein oilcake, from biodiesel production from sources such as soya beans, which are currently being imported. Concerns have been raised that biofuels production could lead to an oversupply of these by-products. The analysis for the development of the Strategy showed that this would not be the case for biofuels production of up to 4.5%, therefore the 2% incubation level proposed on this revised Strategy, will also not have any impact. DDGS will be absorbed into the animal feed without any major expansion in the livestock industry. This fact has been confirmed by the animal feed industry during the stakeholder consultation process. The animal feed will provide important additional income streams for biofuels plants.

The concern about animal feed is premised on the South African livestock industry remaining static and, in particular, there not being an expansion of the feedlot industry. Such expansion is already taking place, for example under the Livestock Beneficiation Programme of the North West province. The expansion will increase the demand for animal feed and increase the supply of cheaper meat and dairy products in the country.

### **6.4 Land issues**

In the consultation process community members expressed concern that the price of land might be high as a result of biofuels production and also that they have been approached by potential developers willing to buy their land. The production of biofuels can contribute to the objectives of the Land Reform and Restitution programmes by providing sustainable market access for farmers who benefit from these programmes, particularly on development projects run by state-owned enterprises. Thus the biofuels industry can enhance rural development and economic activities for new, black landowners. In addition, meeting the 2% biofuels target will require only about 1.4% of national arable land, which is not a significant percentage, given that nearly 14% is currently underutilised.

## **6.5 Water Resources**

The impact of biofuels production on water resources was raised as an important concern during the consultation process. DWAF has noted that much of the country is water stressed and that there are severe limitations on the availability of additional water for allocation to new uses, notably irrigated agriculture which already uses about 60% of the total available resource. Irrigated cropping for biofuels will have to find its water from existing allocations, or compete for scarce new water. The most important threat to water therefore lies in competition with other uses.

Dryland crops such as soya and maize are not listed as water users. Nor is dryland sugarcane, although this crop is recognised as an activity which can have a significant impact on stream flow, and thus availability to other users. Where dryland crops are found to have an undue impact on other users, these will have to be regulated, much as the forestry industry is currently controlled today.

DWAF has also noted that Water Allocation Reform is an important strategy within the Department, and that biofuels feedstock production could take up water made available through this programme.

Certain new dryland crops for biodiesel, such as *Jatropha curcas* and *Moringa oliefera*, could impact on water resources, competing for both land and water with the forestry sector. The Research undertaken through the Water Research Commission does not show *Jatropha* to be a major water consumer but expansion into new crops will have to be monitored.

DWAF notes that impacts on water quality (erosion and siltation, and fertiliser and pesticide runoff) are as important a concern as impacts on available volumes, and that best practice management for both land and water will have to be applied to all biofuels cropping, both irrigated and dryland.

## **6.6 Biofuels Production Plants**

The conventional technology to produce biofuels is well established, and production processes are mature, even in South Africa. More efficient technologies i.e. second-generation technologies, which are not dependent on food crops, are being developed and South Africa should keep abreast of these developments by investing in research and development. This

would be facilitated by the existence of an initial domestic biofuels industry. The 2% that will be supported by a fixed margin scheme will only apply to proven commercial processes and agricultural feedstocks. The selected main crops for biofuels development in South Africa are soya, canola, and sunflower for biodiesel and sugar cane, sugar beet for bio-ethanol.

The biofuels industry needs to support government development priorities and provide investors, both the investors in refining plants and farmers, with a reasonable return on capital, stemming from a security of demand and an acceptable margin between the fuel-based biofuels price and the agricultural feedstock input cost. If the biofuels industry is to achieve the expected level, Government needs to facilitate an environment conducive to investment and the broader participation of previously disadvantaged citizens. Such support must not be excessive (i.e. too costly to the state and public) and should not jeopardise food security. The long-term intention is to reduce support once the industry is established. In other words, once capital has been paid back, efficiencies have improved and entry barriers and costs have been reduced. The 2% biofuels target includes a reasonable return that will only apply up to 2020 for approved projects and litres, and will enable debt to be repaid.

Licensing requirements will need to be streamlined to ensure biofuels development remains sustainable and is not delayed. However, it all developments will have to comply with the required legal and regulatory frameworks.

## **6.7 Fuel Industry**

Internationally, the oil industry is becoming more active in the development of biofuels and is accepting biofuels products, often driven by mandated upliftment. This involvement allows for the better management of biofuels in the conventional fuel-supply chain. This is already done in countries such as Brazil, USA and European countries where biofuels development is supported by the government. The draft Strategy supported the use of existing oil industry infrastructure to accommodate biofuels efficiently and allow biofuels to be regulated under existing oil industry regulations. The specifics of biofuels uptake still need to be negotiated with the oil industry to maximise efficiencies, reduce costs, and ensure that the fuels are fit for the intended purpose.

In the production of petroleum products a number of blending components are used. The introduction of 2006 fuels specification resulted in an increased import of octane boosting

components because almost all refineries in South Africa, at varying degrees, are octane short. The 2006 fuels specifications also resulted in lower sulphur in diesel, which raised concerns with lubricity of low sulphur diesel. Introduction of biofuels into fuels will go a long way in addressing some of these concerns. Biofuels, however, bring an added advantage that they are locally produced and therefore Rand based and therefore present “hedging” potential for the motorist. It is for this reason that it has been deemed beneficial to all that a fixed price<sup>2</sup> contract offered to biofuels producers, in return for reduced crude price risk<sup>3</sup>.

## 6.8 Biofuels contracts

The agricultural sector has a number of active market instruments, agricultural products are generally sold on forward contract basis. Farmers generally sell 80% of their produce on contract for delivery at the end of the planting season, leaving only about 20% for sale on spot. Like in all markets, the contracts are themselves traded, making the secondary and tertiary market the biggest market. Trade in these derivatives is up to 12 times that of the trade in the physical commodity. Although some farmers would sell some of the produce at spot prices, for them to be able to access funding, they would enter into a fixed term contract with milling companies, etc. Without such contracts, farmers cannot get fund to grow and harvest their produce. The failure of homeland farmers is largely attributed to a lack of market for their produce.

The core of the biofuels strategy is the contract to be signed between oil companies and biofuels producers. The details of the proposed contract will be finalised during the development of the implementation plan but in essence biofuels will be bought at a price that will ensure long term viability of both biofuels refining and growing processes. The contract will come with an obligation to supply approved crops grown only in designated areas and with a guarantee that the said crops will be bought at a given price, no matter what the crude oil price is. The price at which plants that produce biofuels buy crops will have to be the same as that paid by those producing for the food sector. If the price was to be different, it would create *arbitrage opportunities* for speculators: buying crops destined for one sector for sale to another

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<sup>2</sup> The price will be adjusted on a regular basis in the same manner as for all fuel price components.

<sup>3</sup> The level of price risk cover is limited to 2% of fuel pool and therefore even if crude price was to fall to levels much lower than current level, the exposure is limited to 2% of fuel pool. The likelihood however is that the price of crude will rise and therefore motorists should, in the long run, benefit more from the transaction.

sector. The idea is not to create a different contract for the biofuels sector. A fixed margin will then be added to the cost of acquisition of feedstock to cover transport and refining costs.

The contracting mechanism will work along the following principles: Oil companies will enter into a contract with biofuels producers and buy biofuels as a blending stock at the agreed price. As per estimated production for a period, monies will be collected from the petrol pump to cover the sale and paid to a dedicated "slate account". Oil companies will then submit claims against the slate account. To ensure that the system functions properly however, payment will be only made to a contracting oil company upon receipt of proof of sale from biofuels producers to the contracting oil company.

### **6.9 Mandating Biofuels Uptake**

Mandatory off-take can only be introduced when security of biofuels supply can be guaranteed. However, the different biofuels manufactures will enter into supply and off take agreement with the individual oil companies. The oil company will in turn claim the amount bought from a dedicated slate, and in turn these costs will be passed on to the motorists on a straight cost recovery basis, based on the agreed rate in cents per litre.

The option of enforcing or mandating biofuels uptake in the initial phase is not favoured rather biofuels producers should be enabled to reduce prices, enabling parties supplied by the oil companies to purchase directly from biofuels producers. However, the mandating of biofuels can be the Petroleum Products Act, which gives the Minister the powers to do this. It is further proposed that petrol containing bio-ethanol should retail at a deregulated price and this is done to facilitate off-take. In this way price deregulation is proposed for biofuels. Such deregulation will also contribute to oil industry liberalisation and support new BEE wholesaler entrants.

### **6.10 Integration**

The biofuels industry provides an opportunity to link the second economy, with the developed first economy, as it is agriculturally-based, requires low levels of technology and is employment intensive. The first economy is a major user of liquid transportation fuels. The integration of the value chain needs clearly defined partnerships. Specifically, the producer incentive scheme

should be limited to litres produced using agricultural feedstock supplied from currently underutilised land in the former homelands.

## **7 The Strategy**

Government intervention and regulation should be considered, but minimised and incentives should decrease over time. Regulation may be needed where there are market failures.

Following comments and inputs from the broader stakeholder groups the biofuels task team, in addressing these comments, particularly around food security, environmental concerns, land concerns, benefits for small farmers, quality control, has revised the initial target of 4.5% as proposed in the draft Strategy to a 2% target in the initial development stages. The Biofuels Strategy initially aims to develop the biofuels industry to achieve a market penetration of 2% of liquid road transport fuels. This would contribute 30% to the national Renewable Energy target for 2013. In terms of the liquid fuels it represents about 30% of national energy consumption. This is to be based on local agricultural and manufacturing production. Imports are limited to ensure increased use of the local produce and local economic development, and in consideration of the biofuels strategy objectives. such as job creation, bridging the gap between 1<sup>st</sup> and 2<sup>nd</sup> economy and promotion of BEEs.

The driver to achieve 2% biofuels investment is an incentive dispensation. The incentive scheme best suited to this is one that ensures biofuels investors and the farmers a reasonable return on assets that is commensurate to risk.

For bio-ethanol, assuming a 100% fuel levy exemption, the support price was determined as R4.20 per litre (\$65 per barrel crude oil equivalent), whereas for biodiesel, assuming a 50% fuel levy exemption, a supportive price on an equitable basis would be R4.88/litre (about \$80 per barrel crude oil equivalent).The proposed incentive hedges biofuels producers and fuel consumers against low and high oil prices respectively. The costs of the incentive entail:

- The fuel levy reduction that at 50% equates to R15 000 per job. With justification, this rebate can be raised to 100%, or roughly R30 000 per job, which will still be competitive when compared to the cost of jobs for fuel retail site attendants. World

Trade Organisation (WTO) rules allow for 100% fuel levy reductions for biofuels. A 100% reduction, given the relatively low South African fuel levy, would cost the fiscus less than 3 cpl on *overall* fuel levy income.

- The cost of forecourt attendants' jobs built into the petrol price is 8.9 cents per litre for about double the number of jobs. Thus, just as self-service at petrol stations are prohibited to protect jobs, so too should biofuels receive some similar level of protection to ensure job creation. Biofuels has added environmental and balance of payment benefits.

The biofuels industry strategy further recommends that the following blending levels be achieved, for Biodiesel B2 or 2% blending requirement and for Bioethanol E8 or 8% blening requirement. For the initial investments and development of biofuels in the country the following crops will be used for the production of the biofuels, for Bioethanol sugar cane and sugar beet and Biodiesel soya bean, canola and sunflower.

## **8 Specific Interventions**

### **8.1 Licensing of Producers**

Biofuels producers, like any other petroleum product producers, need to be licensed by the Petroleum Products Controller: "*A person may not- (a) manufacture petroleum products without a manufacturing licence... issued by the Controller of Petroleum Products*". Thus under the act all petroleum producers small and large will have to apply for a manufacturing license. Biodiesel producers are already registered with SARS for the fuel levy exemption. This registration needs to be extended to bio-ethanol producers.

The licence will only apply to qualifying producers up to a 2% penetration level of locally produced biofuels, for qualifying litres. Once the required level of production and biofuels penetration level has been reached, the licensing will be reviewed and adjusted accordingly. Biofuels producers will have to meet the licensing condition which will include amongst others, crop selection, feedstock availability, quality requirements, environmental standards (Environmental Impact Assessment), water restrictions, industrial

## **8.2 Off-take by Petroleum Wholesalers Based on Discounting**

Biofuels economics are optimised when logistics and costs are minimised. Hence the preferred off-takers, excluding own use by producers and directly by consumers close to biofuels plants, will be via the existing oil industry at the depots, or refineries, closest to the biofuels plants. This would involve blending biofuels components in accordance with SANS standards. Currently this amounts to 5% for biodiesel and up to about 10% for fuel ethanol. Higher levels, particularly of biodiesel, could be used in dedicated fleets. Using the existing oil industry helps ensure quality control. With some level of discounting to the Basic Fuel Price (BFP) of the competing mineral petroleum product, oil wholesalers should take biofuels.

Mandatory blending is not recommended for the 2% incubation phase. Over time, as the biofuels industry matures, the existing wholesale licences can be amended to mandate the uptake of biofuels. However, the mandating of biofuels could be done under the section 9(g) of the *Petroleum Products Wholesale Licence* regulations (R287, 27 March 2006) or via an instruction from the Controller of Petroleum Products in terms of section 12(3)(h)(ii) of the regulations. The price for such licensed volumes could be based on BFP. A discount can be included to account for the actual relative value and to cater for additional depot and market handling costs. Section 2(1) (c) of the *Petroleum Products Amendment Act* provides for the regulation of petroleum products prices, should this be required.

## **8.3 Fuel Levy Exemption**

The existing Fuel Levy exemption should continue. Based on job creation benefits, an increase in the exemption to 100% is justified. It is proposed that the biodiesel exemption be fixed at 50% from the 2008 financial year, taking into account the limitations imposed by the diesel tax refund. Bioethanol producers, on the other hand, should receive a 100% fuel levy exemption from 2008. The increased support for bioethanol producers will be balanced by the higher oil price floor for biodiesel producers. This will ensure that both sets of biofuels producers receive equal support per litre of qualifying production.

Biofuels production should also include participation by small investors and producers. Currently biodiesel plants producing under 300 000 litres/annum are fuel tax exempt, and it is recommended that this fuel tax exemption continue. This level was motivated by the need to simplify administrative procedures and is very low when seen against the oil industry, where a

typical refinery produces 20 000 times this volume (exempted biodiesel volumes would constitute 0.005 % of oil refinery volumes) and there is an allowance for product losses of about 0.05 %. Accordingly it is recommended that the small producers' threshold be raised to 1.2 million litres per annum for administrative fairness.

#### **8.4 Agricultural Support**

The Department of Agriculture has a number of programmes to support development of local agricultural production and value addition. These include programmes for small-scale and emerging farmers. Such programmes can be targeted to support farmers in crop selection, hedging, agricultural methods, logistics, infrastructure, research and development, and in negotiating contracts with biofuels manufacturers.

#### **8.5 Capacity Building and Development**

Government should ensure the training and capacity building of previously disadvantaged communities and emerging entrepreneurs to maximise transformation and the benefits inherent in this industry. These activities should be performed in conjunction with the Sector Education and Training Authorities (SETAs), particularly in the agricultural and energy sectors. It is envisaged that the new biofuels industry be a driver of transformation and skills development, coupled with sustainable job creation.

#### **8.6 Government Agencies**

Bringing underutilised agricultural land into production creates greater macro-economic benefits but also entails higher investment risk. To ensure such development takes place, which may correspond with poverty nodes, government agencies, such as the Central Energy Fund (CEF) and the Industrial Development Corporation (IDC) should become involved, with support from the provincial agricultural departments. The CEF and IDC should maximise Black Economic Empowerment (BEE) in such developments, particularly by including exit strategies allowing them to sell their investments to BEE players. These BEE investors could be assisted by the National Empowerment Fund and any other programmes that may be introduced.

State Owned Entities (SOEs) can play an important if not a leading role in getting the infant biofuels industry off the ground. Their roles will be different according to their different functions. On the supply side Central Energy Fund (CEF) and the Industrial Development Corporation (IDC) will play a role as investors in public private partnerships or even as investment consortium leaders or indeed even as individual investors. They might even

consider playing a role as lenders to biofuels projects. The strengths they bring to bear are a commercial approach and project evaluation which could be useful to small and medium enterprises. The Land Bank can play a crucial role in financing small farmers or small farmer cooperatives.

On the demand side some SOEs and Government Departments and agencies are large consumers of fuels. Examples are Transnet, Eskom and the Department of Defence. Again Government wishes to play a role on the demand side by for example specifying in tender requirements that biofuels constitute a part of the fuel supply contract. A key requirement for all such SOEs or Departments is that their shareholder compacts or Departmental strategic plans reflect their roles in carrying forward the implementation of the Biofuels Strategy. This requirement places the onus on the “shareholder departments” to ensure that the shareholder compacts contain such provisions.

## **9 Other**

### **9.1 SADC Integration**

The agricultural production potential is greater in many of our SADC neighbours. Accordingly any biofuels developments in these countries should be encouraged in as far as they benefit the region, specifically regarding job creation and economic growth. However, given the early stages of the South Africa biofuels industry it would be prudent to focus on local development first. The *SADC Energy Protocol*, which includes fuel specification rationalisation, should be used to encourage inclusion of biofuels in the regional fuel pool and develop regional biofuels specifications. South Africa, by embarking on a biofuels development programme, will facilitate our involvement and leadership in the regional biofuels industry. There is scope for future co-operation in biofuels projects throughout Sub-Saharan Africa within existing NEPAD energy projects.

### **9.2 Future Research and Development**

It is expected that the demand for biofuels will gradually increase overtime and this will necessitates the innovative solutions to the current limitations (feedstock and technology) be sought through research and development (R&D). In this regard South Africa will create and

R&D platform that will allow for the strengthening of local capacity and also leverage on international R&D work. The Department of Science and Technology (DST) together with relevant stakeholders within the National Systems of Innovation (NSI) will facilitate the development and coordination of this work through a biofuels R&D plan that will focus on the total value chain. The research focus areas will include investigating the use of alternative feedstock, development of energy crops (i.e. drought tolerance, high yield per ha, energy efficient etc.) and improvement of known technologies whilst further developing, supporting piloting of the second generation technologies

## **10 Implementation Plans**

The Biofuels Task Team focussed on determining an achievable level and type of national biofuels industry, and the policy measures needed to ensure this. Until the Strategy is approved it did not make sense to develop a comprehensive implementation plan and hence there was only a limited examination of implementation details. The proposed policy requires partnerships and support from a number of stakeholders, many of them in the private sector, for its success.

Implementation aspects were, however, covered briefly to give stakeholders an idea of what is being considered, but details will be developed when the Strategy is approved. It is recommended that the Biofuels Task Team continue established, but that it shifts its focus to implementation, monitoring and strategy refinement.

Given the availability of existing mechanisms and funds, the infancy of the biofuels industry and the desired phasing-in thereof, it is prudent to start with existing funds and resources.

### **10.1 Communication and Education**

Public education will constitute an important element of Strategy implementation. The Biofuels Task Team, in collaboration with Government Communication and Information System (GCIS), should lead the biofuels communication drive, which should emphasise the incentives and requirements to comply.

### **10.2 Monitoring and Evaluation**

Monitoring and evaluation will primarily be enabled by the licensing system for biofuels producers and petroleum wholesalers. In addition, the reasonable return on assets scheme will provide ongoing liaison with producers and developments. This will be done by the DME with assistance from the Biofuels Task Team. DME approach will be to refine the strategy as the industry develops – this is common practice in countries even with longstanding biofuels programmes, typically having major review every five years. Once the initial 2% penetration level has been achieved, a formal review of the Strategy will be held. It is expected that this should occur at least before 2013.

### **10.3 The Way Forward**

The immediate focus is on incubating the industry to a 2% biofuels penetration level and encouraging the use of agricultural feedstocks from currently underutilised lands. For this goal to be realised, the support mechanism needs to be finalised and announced. Initially the ambit of the fixed margin support mechanism should be communicated, and submissions as to the levels (SA cpl) required for this be obtained. This would enable the approved support mechanism to be introduced as part of the 2008 budget.

The support level should be fixed for the first 2% biofuels investment through to 2020 to give investors some certainty and a decent rate of return on their assets. The fixed support in SA cpl would, due to inflation, translate into a reduced level of real support over time. In addition, the criteria for approving the 2% investment will need to be finalised. Specifically, only litres produced from agricultural feedstock grown on underutilised land in the former homelands will qualify. Care should be taken to ensure investment incentives are only approved for the 2% penetration level, irrespective of the number of applicants. This is to avoid over exposure of the fiscus and/or consumers.