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DEPARTMENT OF MINERAL RESOURCES AND ENERGY

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SOUTH AFRICAN BIOFUELS REGULATORY FRAMEWORK

Approved by Cabinet 13 December 2019

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1. INTRODUCTION

There is consensus that the blending of biofuels into conventional transport fuel results in a cleaner burning fuel with significantly less fine particulate matter emissions which are harmful to human health. Biofuels also reduce the greenhouse gas emissions associated with transport fuel production and use, especially the second and third generation biofuels which use waste (including agricultural and industrial waste and emissions) as feedstock. In addition to the environmental benefits, commercial scale production of biofuels for use in transport fuel has also been identified as a potential source of new employment and economic development. Like other developing countries, South Africa recognises that first generation (crop-based) biofuels can ameliorate the declining agricultural sector. However, first generation biofuels production can be a risk to food security if commercial farmers switch from food to biofuels feedstock production.

In 2005 the then Department of Minerals and Energy ("DME") proposed the development of a biofuels industry to Cabinet. Cabinet mandated the DME to lead an inter-departmental Biofuels Task Team ("BTT") which drafted the country's Biofuels Industrial Strategy ("BIS"). The BIS was approved by Cabinet on 5th December 2007. The BIS provided for a five-year pilot phase from 2008 to 2013, during which a two percent (2%) penetration level of biofuels in the national transport fuels (petrol and diesel) pool needed to be achieved. The objective of the pilot phase was to monitor and verify the socio-economic benefits of the proposed national biofuels programme as well as to identify any unintended adverse consequences e.g. pressure exerted on food supply/prices and on the fiscus due to the subsidy that was proposed to start the new industry.

The cost of producing first generation biofuels is still higher than the cost of conventional mineral transport fuels. Therefore, there is no financial incentive for transport fuel manufacturers to buy and blend biofuels into conventional mineral fuels. Globally, the use of biofuels as a transport fuel is enabled by national mandatory blending policies to reduce the negative environmental impact of transport fuel use.

The cost of producing third generation biofuels production seem to be much lower but government policies are still required to support the blending of the biofuels.

The mandatory blending of biofuels in transport fuel creates a captive market for the biofuels manufacturing industry. In markets like South Africa where transport fuel price is regulated, the downside to this is that the biofuels prices tend to be linked to the conventional fuel

prices, thus making the determination of their viability complex due to the volatility of crude oil and conventional transport fuel prices. For the biofuels projects to be bankable and for a new industry to be established, the biofuels off-take prices have to be "artificially stabilised" or subsidised in addition to the enabling policy and regulatory framework for commercial scale production of biofuels for use in transport fuels. The subsidisation of biofuels manufacturing is justifiable as blending of biofuels reduces the negative environmental impact of transport fuel use and a biofuels programme has other socio-economic benefits including substantial job creation and reduction of fuel imports.

2. PURPOSE OF THE BIOFUELS REGULATORY FRAMEWORK

The purpose of this South African Biofuels Regulatory Framework is to provide a policy and regulatory framework for the implementation of the Biofuels Industrial Strategy of 2007 (BIS). The targeted biofuels penetration is 4.5% v/v of the national fuel pool with 2% expected to come from first generation biofuels technologies. There are five aspects to the Biofuels Regulatory Framework:

a. The Feedstock Protocol – this will regulate the agricultural production of biofuels feedstock to mitigate the risk of the biofuels programme to food security. Being a water-scarce country, the feedstock protocol also prioritises projects that use rain-fed crops. The feedstock protocol recognises that 2nd and 3rd generation biofuels completely eliminate the food versus fuel debate.

b. The mandatory blending regulations – the mandatory blending regulations came into effect in October 2015 and create certainty of biofuels demand by compelling licensed manufacturers and wholesalers of petroleum products to buy and blend locally produced bioethanol and biodiesel at a minimum of 2% of their petrol and 5% of their diesel market demand, respectively. In agreement with the South African Petroleum Industry Association (SAPIA) the biofuels transfer price will be set at the Basic Fuels Price (BFP) in these regulations. The fuel specifications for fuel grade biofuels and the blended transport fuels have been developed and gazetted.

   The definition of biofuels in the mandatory blending regulations will be amended to include 2nd and 3rd generation biofuels.

c. The cost recovery mechanism for blending of biofuels – since South Africa has a price regulated fuel market, it was agreed that the licensed petroleum products manufacturers who will be the biofuels blenders will remain cost neutral. The pricing of the biofuels at BFP allows for this price neutrality. The cost of new infrastructure and equipment required for blending will be recovered through the Regulatory Accounts System (RAS) or other mechanism that the Department may deem more appropriate.

d. The Biofuels Subsidy Mechanism – as a result of technology improvements and new technology developments, the cost of production of biofuels has been declining but it is still higher than the cost of producing conventional mineral fuels. The biofuels transfer price to fuel manufacturers will be the Basic Fuel Price (BFP) which might be below the cost of some biofuels production. This biofuels regulatory framework provides for a biofuels subsidy mechanism to support the development of a new biofuels industry. The subsidy mechanism has two components – the biofuels farmers support and the biofuels manufacturers support.

   Biofuels manufacturers will compete for the subsidy to be received. Since second and third generation biofuels do not create as many jobs as first generation biofuels, only first generation biofuels projects will be subsidised.

e. The selection criteria for biofuels projects requiring a subsidy – for the first generation biofuels projects that require the biofuels subsidy, the selection criteria is an objective mechanism for selecting the projects to be subsidised. It considers the amount of subsidy required against the socio-economic benefits to be derived.

In the 2013 Budget Review, the Minister of Finance confirmed Government's commitment to subsidise the industry through an increase in the Fuel Levy in terms of the Customs and Excise Act, No. 91 of 1964. Based on the assumptions of the cost of biofuels manufacturing at the time, the Minister of Finance indicated that the biofuels levy would be in the region of 3.5 – 4 ZAR cents per litre (cpl) on all petrol and diesel sold in South Africa.

The first phase of the biofuels programme will be continually monitored and its impact (socio-economic benefits, cost to the economy, issues arising from the industry) reported to Cabinet which will make the decision on the implementation of the next phase once the 4.5% penetration levels of biofuels in the national transport fuel pool has been achieved.

3. HISTORIC CONTEXT

South Africa produced biofuels in the 1940's to the 1960's as ethanol, which was marketed under the brand name Union Spirit which had dedicated pumps on many service station forecourts.

In the industrialised and middle-income developing countries, where agriculture's broader social and rural development attributes have been recognised and prioritised, the development of a biofuels industry can play a significant role in enhancing the agricultural sector. This, in addition to the environmental benefits of blending biofuels into transport fuels, has led to a widespread development of the biofuels industry in many developing countries.

In 2005 the Cabinet for the Republic of South Africa 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).

In its submission to Cabinet, the BTT had proposed a pilot phase of 4.5% biofuels penetration in the national fuel pool. The BTT acknowledged that the impact of the biofuels subsidy on the fiscus cannot be projected accurately as well as the impact of biofuels feedstock production on food security, water resources and the environment could not be predicted accurately. In its decision of 5 December 2007 Cabinet deemed it prudent to start the industry with a pilot phase of 2% national fuel demand equivalent having taken into consideration the risks and unknown unintended consequences that may arise from the development of the biofuels industry. Based on the total national fuel pool of just over 23 billion litres per annum at the time, this translated to a biofuels manufacturing target of about 460 million litres per annum. A copy of the Biofuels Industrial Strategy can be downloaded from the website of the Department of Mineral Resources and Energy.

The Department of Mineral Resources and Energy also 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.

The Cradock Sugar Beet to Bio-ethanol Project wherein CEF SOC Ltd and the Industrial Development Corporation (IDC) were the developers was adopted as a case study by the BTT. This project confirmed that commercial scale biofuels manufacturing is not financially viable at the prevailing feedstock and conventional fuels prices. To address these challenges, the following were identified as necessary:

- Creating a regulatory environment that creates a captive market for biofuels as free market negotiations would fail. Regulations regarding the Mandatory Blending of Biofuels with Petrol and Diesel (hereinafter referred to as "Mandatory Blending Regulations") were, amongst others, deemed to be the most appropriate to achieve the desired outcome. The Mandatory Blending Regulations would guarantee the uptake of all biofuels supplied by local biofuels manufacturers by compelling licensed manufacturers of petroleum products and their wholesaling arms to buy and blend all the biofuels availed by the local biofuels manufacturers;

- The development of criteria for the licensing of biofuels manufacturers in terms of the Petroleum Products Act, 1977 (Act No. 120 of 1977), as amended;

- The development of an appropriate Biofuels Pricing Framework to regulate the biofuels transfer price between manufacturers and blenders – this was negotiated and agreed with the South African Petroleum Industry Association (SAPIA) to be the Basic Fuel Price (BFP).

- The establishment of a subsidy mechanism to make the biofuels manufacturing financially viable;

On 23 August 2012, the Mandatory Blending of Biofuels with Petrol and Diesel (hereinafter referred to as "Mandatory Blending Regulations"), were promulgated and these came into effective on 1 October 2015. [The Mandatory Blending Regulations can be downloaded from the DMRE website]. 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 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 then Minister of Energy also approved the establishment of a Biofuels Implementation Committee (BIC) comprising the oil industry, biofuels project developers, as well as other parties (e.g. Transnet) as and when required. The BIC, which is chaired by the DMRE, seeks to address all matters pertaining to the practicalities of blending biofuels with conventional 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 Green Transport Strategy of South Africa identifies biofuels as one of the clean transport fuels for the transition towards a lowers carbon transport future of the country. Even with the introduction of electric vehicles, a new biofuels industry is still relevant and sustainable in South Africa as it will:

- Reduce air pollutants and GHG emissions in the transport sector by reducing petrol or diesel use
- Be used in the aviation industry in line with the objectives of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)
- Reduce imports of transport fuels
- Create and preserve jobs in the agricultural industry.

4. REGULATORY FRAMEWORK FOR THE BIOFUELS INDUSTRY

4.1 Mandatory Blending Regulations

The Mandatory Blending of Biofuels with Petrol and Diesel (hereinafter referred to as “Mandatory Blending Regulations”) were promulgated on 23 August 2012 came into effect on 1 October 2015 as announced by the Minister of Energy on 30 September 2013.

The Mandatory Blending Regulations create the necessary captive market for the nascent local biofuels industry.

In terms of the Mandatory Blending Regulations there is a minimum 2% mandatory blending of bio-ethanol into petrol and a minimum 5% mandatory blending of biodiesel into mineral diesel (subject to availability of locally produced biofuels). The petroleum products specifications and standards have been amended accordingly to provide for the biofuels blended fuels.

The regulations will be amended to define the regulated transfer price of biofuels as the Basic Fuel Price (inclusive of zone differential) and to expand the definition of biofuels to include 2nd and 3rd generation biofuels.

A Biofuels Implementation Committee (BIC) has been established to ensure that all the practical and/or operational aspects pertaining to the blending of biofuels with conventional petrol and diesel are resolved for the Mandatory Blending Regulations to be operationalized.

4.2 Cost Recovery Mechanism for blending costs

In order to optimise logistics costs and ensure product quality blending will only take place at petroleum products storage facilities (depots) or at refineries for the first phase of the biofuels programme. The blenders will purchase the biofuels from local biofuels manufacturers at the Basic Fuel Price (inclusive of zone differential).

The blenders will remain cost neutral from the blending of biofuels as they will be allowed:

a. an appropriate cost recovery of the capital invested for the necessary blending infrastructure;
b. and the associated operating costs for blending.

The DMRE, after consultation with the blenders will make a determination of the blending infrastructure required, the capital costs that will be incurred by the blender as well as the operating costs of blending. The blenders will recover these costs through the application of the Regulatory Accounts System (RAS) or other mechanism that the Department may deem more appropriate.

4.3 Biofuels Feedstock Protocol

As part of the qualification criteria for participating in the biofuels programme, the Biofuels Feedstock Protocol has been developed by the Department of Agriculture, Land Reform and Rural Development to ensure that the commercial scale biofuels programme does not negatively impact food security and the environment (water and biodiversity) yet at the same time achieves the objectives of sustainable job creation and introducing new emerging and black farmers in agriculture.

The Biofuels Feedstock Protocol (attached hereto as Annexure 1) has the following objectives:

4.3.1 Mitigating the risk to food security

The implementation of a biofuels programme premised on 1st generation biofuels always require that measures are put in place to safeguard against compromising food security (viz. both availability and affordability). The Biofuels Feedstock Protocol serves to safeguard food security by:

a. Prohibiting the use of maize as per the 2007 Biofuels Industrial Strategy;
b. Prioritising the use of fallow land for biofuels feedstock production;
c. Prioritising biofuels feedstock production that does not require irrigation;
d. Permitting the use of farms under production for biofuels feedstock production only if the biofuels feedstock production is part of plant rotation that augments the financial viability of the farm.

4.3.2 Reducing impact on the environment (water and biodiversity)

In addition to ensuring that biofuels feedstock supply does not threaten food security, the Biofuels Feedstock Protocols seeks to ensure that there is benign impact on the country's natural resources (water and biodiversity) as a result of the agrarian feedstock supply to the biofuels manufacturing plants. To this extent, the Biofuels Feedstock Protocol prioritises rain-fed feedstock production. The Department of Agriculture, Land Reform and Rural Development has identified areas with sufficient rainfall for unirrigated production of sorghum, sugarcane and soya. In exceptional circumstances where irrigation of biofuels feedstock crops is required, water use licenses [for production and irrigation of crops as well as use by the manufacturing plant – Section 21a – k of the National Water Act, 1998 (Act no. 36 of 1998)] will be controlled by the Department of Human Settlement, Water and Sanitation.

The use of jatropha is excluded as a biodiesel feedstock crop due to biodiversity concerns and to protect local bird and animal species from poisoning since jatropha is an alien plant with toxic leaves and pods.

4.3.3 Supporting the domestic agricultural sector and new black farmers

The first generation biofuels production is intended to support the South African agricultural sector therefore agrarian feedstock for biofuel manufacturing has to be sourced from local farmers. In the event of crop failure arising from natural disasters, importation of biofuels feedstock will be permitted for that limited period. The Department of Agriculture, Land Reform and Rural Development will manage the adherence to this requirement and will provide the necessary approval to import feedstock in the event of crop failure due to unforeseen natural occurrences.

The Biofuels Feedstock Protocol makes it a requirement for biofuel manufacturers to advance the national government objectives of supporting rural development, new black farmers' programmes as well as land and reform restitution initiatives.

4.4 Biofuels Subsidy Mechanism

Subsidisation of biofuels production is justifiable as it significantly reduces the fine particulate matter emissions when blended into conventional transport fuel. These emissions are harmful to the environment and to humans. Biofuels also reduce the greenhouse gas emissions associated with transport fuel production and use, especially the second and third generation biofuels which use waste (including agricultural and industrial waste and emissions) as feedstock. In addition to the environmental benefits, a biofuels manufacturing programme has other socio-economic benefits. Commercial scale first generation biofuels manufacturing creates a sustainable demand for agrarian feedstock (e.g. sorghum, soya, sugarcane) thereby creating a captive market on which new farmers can be established. In South Africa a biofuels programme has the potential to preserve jobs in the sugar-cane agricultural industry which is facing serious challenges arising from the decline in domestic sugar demand. Second and third generation biofuels production has the added benefit of being a commercial use of CO_2 emission sequestration since the feedstock used is waste and carbon emissions from industrial plants.

The IDC has undertaken an economy wide impact assessment of a 460 million Litres 1st generation biofuels programme in South Africa and concluded that the economic benefits (e.g. over 13,000 direct new jobs in rural areas, R1.8 billion corporate and individual tax contributions to the fiscus, balance of payment savings of R1.3 billion from reduced fuel imports) far outweigh the cost of the subsidy which was estimated at about R800million year (equivalent to 3,5c/Litre on fuel used in the country).

Since 2007 the BTT has considered different biofuels subsidy mechanisms including:

a. Providing a subsidy based on the difference between the transfer price (BFP) and the cost of production of biofuels as calculated from a "reference biofuels plant". The subsidy required was to be recovered from the fuel price as a "biofuels subsidy".
b. A competitive bidding process for the "biofuels subsidy" in which biofuels manufacturers compete for a subsidy based on their cost of biofuels conversion (or fixed cost) and variable (feedstock) costs. The subsidy required was to be recovered from the fuel price as a "biofuels subsidy".

In April 2019, Cabinet instructed the Department of Mineral Resources and Energy to design a subsidy mechanism that directly benefits the farmers and is not an open ended liability to the fiscus. The Biofuels Subsidy will only be used to support first generation biofuels projects and it has the following two components:

4.4.1 The Biofuels Farmers Support

The Department of Agriculture, Land Reform and Rural Development will have to develop and manage a farmer's support programme for new black farmers participating in the biofuels programme. The biofuels farmers support programme will be coordinated at national level. The support will include

i. Financial assistance for establishment infrastructure covering irrigation systems, sewerage, processing and packaging facilities.
ii. Financial assistant for the initial production inputs including seeds and pesticides.
iii. Technical support for crop and farm management.
iv. Research and development (R&D) to develop high yield seeds for biofuels feedstock crops. This will be done in collaboration with universities and other relevant research institutions like the ARC and CSIR.

v. Financial support for the farmers to have equity participation in the biofuels manufacturing plant that they are supplying.

National Treasury will have to provide the Department of Agriculture, Land Reform and Rural Development with an annual budget allocation for the Biofuels Farmers Support Programme.

4.4.2 Biofuels Manufacturers Support

There are a number of government financial support instruments for new investments, infrastructure and industrial projects that biofuels manufacturers can apply for. In addition, the Department of Trade, Industry and Competition (the dtic) and NT will have to establish a biofuels manufacturers support mechanism. The biofuels manufacturers' subsidy will be a once-off capital subsidy paid at pre-determined milestones during the construction and commissioning phase of the selected biofuels projects and/or a variable subsidy based on the BFP for a fixed period, say 15-20 years.

National Treasury and the dtic will determine the amount and also manage the biofuels manufacturers capital subsidy. The variable long term subsidy will be managed by the DMRE.

4.5 Selection Criteria for Biofuels Projects to be subsidised

The biofuels manufactures to be subsidised will be selected through a fair and transparent selection process that is based on the principle of value for money (i.e. subsidy amount versus the number and quality of jobs to be preserved or created as well as other social, economic and environmental benefits).

The BTT will develop a selection criterion for biofuels manufacturing projects to receive the biofuels subsidy.

Based on the feedstock supply plan of the selected biofuels project, the Department of Agriculture, Land Reform and Rural Development will identify the farmers to receive the farmers' subsidy and support.

Beneficiaries of the biofuels subsidy mechanisms will be required to enter into a financial support (subsidy) agreement with the government.

5. LICENSING, PERMITTING AND AUTHORISATION OF BIOFUELS MANUFACTURING IN SA

Commercial scale manufacturing of biofuels in South Africa will require, *inter alia*, the following permits, licenses and authorisations:

5.1 Licensing of petroleum products storage facilities (depots) as Blending Facilities

In terms of Petroleum Pipelines Act, 2003 (Act No. 60 of 2003), petroleum storage facilities (depots) require licences from NERSA. Once a licensed storage facility commences blending operations it will become a manufacturing facility. This means that the licensee will be required to apply to NERSA to revoke its storage facility licence and to apply to the DoE for a manufacturing licence.

5.2 Biofuels Manufacturing License in Terms of the PPA (Act No.120 Of 1977)

In terms of the Petroleum Products Act, 1977 (Act No. 120 of 1977), as amended ["PPA"], manufacturers of biofuels for use in transport fuels must apply for and obtain a manufacturing license from the Office of the Controller of Petroleum Products. The criteria for licensing manufacturers of biofuels in terms of the Petroleum Products Act are available from the website of the Department of Mineral Resources and Energy.

5.3 Approval of the Feedstock Supply Plan

First generation biofuels manufacturers using agricultural feedstock will be required to submit a Feedstock Supply Plan to the Department of Agriculture, Land Reform and Rural Development for approval. The Department of Agriculture, Land Reform and Rural Development will use the Biofuels Feedstock Protocol (attached hereto as Annexure 1) as a basis for making a decision in respect of the Feedstock Supply Plan application.

5.4 Environmental Authorisation and Licenses

The construction, operation and decommissioning of a biofuels manufacturing plant as well as potentially feedstock production on land not previously used for crop production will require the necessary environmental impact assessment (EIA) authorisation and associated licenses e.g. Atmospheric Emission License (AEL). The Department of Environment,

Forestry and Fisheries provides the necessary guidelines and approval processes for the requisite environmental authorisations and licenses.

5.5 Water-Use License

Any activity (e.g. production of feedstock, discharge of waste water, alteration of wetlands/ watercourses) or development including infrastructure, for the manufacturing and supply of biofuels that interferes or interacts with water resources as defined in the National Water Act, 1998 (Act no. 36 of 1998) requires a water use entitlement as contemplated in section 21 and 22 of the said Act. A water use entitlement means a water use licence, an existing lawful water use or a general authorisation. Water availability is influenced by the Reserve Determination, the current use of the water resource in the catchment and international obligations and these factors dictate the volume of water and water quality impact that can be further allocated or allowed e.g. for agricultural and/or industrial activities. Whereas the irrigation of crops requires a water use entitlement to abstract water in terms of section 21(a) of the National Water Act of 1998, dry land (e.g. sugarcane) crops used as feedstock for the manufacturing of biofuels could be declared stream flow reduction activities and would then also require authorisation in terms of section 21(d) of the same Act. Section 21(c) and (i) of the Act regulates activities that occur in or adjacent to watercourses, including wetlands and also require authorisation from DWS. Water quality impacts of water uses associated with for instance industrial activities are regulated in terms of section 21(f) to (h) of the Act.

Biofuel feedstock producers and the manufacturers will be required to procure the necessary water-use licenses from the Department of Human Settlement, Water and Sanitation or its designated authority.

5.6 Land-Use Permit

Biofuels manufacturing will be conducted in an area wherein the licensed biofuel manufacturer is the legal owner of the land on which the activity will be undertaken. Alternatively a licensed manufacture may rent the land from another land owner in which case it must have the written permission from the land owner concerned. Areas which are under municipal authority are expected to have title deeds or lease agreements and areas which fall under tribal authority are expected to have permission to occupy from their tribal authority.

A biofuels manufacturing plant should be located in an area wherein the local authority has zoned such area for purposes that allow for biofuels manufacturing. If the area is under

municipal authority, a zoning certificate from such municipality will be required, and if it is under tribal authority, a letter from local tribal authority will be required.

6. IMPLEMENTATION PROCESS

The successful development of the biofuels industry depends significantly on the integration of activities between a number of Government departments and state entities. Among Government departments that should be actively involved in the implementation of the regulatory framework are the ones outlined below:

a. Nersa – where required, revoke licenses for petroleum storage facilities that become manufacturing facilities in accordance with the Petroleum Pipelines Act.

b. Department of Mineral Resources and Energy – will consider the licensing and permitting applications for the manufacturing of biofuels under the Petroleum Products Act.

c. Department of Human Settlement, Water and Sanitation (DWS) – will consider and make determinations for applications of water-use entitlement for irrigation and industrial use.

d. The Department of Environment, Forestry and Fisheries – will consider and make determinations for the environmental authorisations, licenses and permits.

e. Department of Agriculture, Land Reform and Rural Development – will be responsible for evaluating and approving the prospective first generation biofuels manufacturers' Feedstock Supply Plans. The Department of Agriculture, Land Reform and Rural Development will also manage the Biofuels Farmers Support Programme.

f. Department of Higher Education, Science and Technology – will support research and development for all aspects of the biofuels value chain and investigate continuous improvement opportunities.

g. The budget allocation for the Biofuels Subsidy Mechanism is a competence of National Treasury.

h. The administration of the capital subsidy for the biofuels manufactures will be undertaken by NT and dtic.

i. The coordination, monitoring and evaluation of the Biofuels Programme as well as the verification of socio-economic benefits set out in the Subsidy Agreements will be undertaken by the Biofuels Task Team led by the Department of Mineral Resources and Energy.

ACRONYMS AND DEFINITIONS OF WORDS USED IN THIS DOCUMENT

ARC	Agricultural Research Council
BBBEE	Broad Based Black Economic Empowerment
BFAP	Bureau of Food and Agricultural Policy of the University of Pretoria
BFP	Basic Fuels Price
BIC	Biofuels Implementation Committee
BIS	Biofuels Industrial Strategy
Blenders	Transport fuel manufacturers who will buy locally produced biofuels and blend it into the conventional crude oil based fuels.
BTT	Biofuels Task Team
Capex	Capital expenditure
CF1	Cleaner Fuels One Programme
CF2	Cleaner Fuels Two Programme
CPI	Consumer Price Index
Cpl	Cents per litre
DAS	Duty at Source
DEA	Department of Environment Affairs
Depots	Petroleum storage facilities
DJP	Durban-to-Johannesburg Pipeline
DoE	Department of Energy
DME	Department of Minerals and Energy
DMR	Department of Mineral Resources
DMRE	Department of Mineral Resources and Energy
dtic	Department of Trade, Industry and Competition
DHSWS	Department of Human Settlement, Water and Sanitation
EIA	Environmental Impact Assessment
GHG	Greenhouse Gas
IPPs	Independent Power Producers
MOU	Memorandum of Understanding
NERSA	National Energy Regulator of South Africa
NMPP	New Multi-Product Pipeline
NT	National Treasury
Opex	Operating expenditure
PFMA	Public Finance Management Act

PPA	Petroleum Products Act
PPI	Producer Price Index
RAF	Road Accident Fund
RVP	Reid Vapour Pressure
SADC	Southern African Development Community
SAFEX	South African Futures Exchange
SAPIA	South African Petroleum Industry Association
SASA	South African Sugar Association
SARS	South African Revenue Services
SMMEs	Small Medium and Micro Enterprises
USA	United State of America
USD or $	United States (of America) Dollar
ZAR	South African Rand
%	Percent

agriculture,
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Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

ANNEXURE 1 of the Biofuels Regulatory Framework

NATIONAL BIOFUELS FEEDSTOCK PROTOCOL

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1. Introduction

The rising demand for energy and the over-dependence on oil from politically unstable regions as well as anticipated fossil fuel shortages have made energy security an increasingly critical issue for most countries around the world. In addition, the projected impacts of climate change are forcing governments to limit greenhouse gas emissions. The concerns around environmental degradation and volatility of oil supply and oil prices led to the development of alternative energy sources worldwide. These concerns also caused the South African Government to start considering the introduction of biofuels (i.e. bio-ethanol and biodiesel) into the transport fuels market.

Cabinet ultimately approved the National Biofuels Strategy (BIS) in December 2007. Cabinet, however, excluded maize as a feedstock mainly due to concerns around food security. The BIS also excludes the use of Jatropha for biofuels production as it posed a threat to biodiversity. Mandatory Blending Regulations for the blending of biofuels with Petrol and Diesel were promulgated on 23 August 2012 to come into effect on 1 October 2015 as announced by the Minister of Energy on 30 September 2013.

The energy sector is closely linked to agriculture as energy is both generated by and used for agricultural activities. The rapidly increasing demand for liquid biofuels is connecting agriculture and energy more closely than ever, both through market forces and government policies encouraging biofuel use. The Biofuels Regulatory Framework attributes the following roles to the Department of Agriculture, Forestry and Fisheries (DAFF):

- Approval of biofuels feedstock supply plans; and
- Mobilisation and supporting participation of farmers in the production of feedstock crops.

The Biofuels Feedstock Protocol is an integral part of the Biofuels Regulatory Framework. It is intended to guide the Government, biofuel manufacturers, farmers and other stakeholders with regard to matters on feedstock production and feedstock procurement to ensure that feedstock production is done in a sustainable manner that minimises the risk to food security in the country.

2. Purpose

The purpose of the Biofuels Feedstock Protocol is to provide a framework for sustainable production and procurement of feedstock crops in support of a prosperous and sustainable biofuels industry in South Africa.

3. Types of Feedstocks

3.1 First-Generation Biofuels

The first-generation biofuels refer to the biofuels that have been derived from sources like sugar, starch, and plant oils, using conventional technology / techniques of production.

Bio-ethanol is produced through the use of enzymes and micro-organisms during the process of fermentation of starches and sugar. The well-known feedstock crops for bio-ethanol production are grain sorghum, sugarcane, cassava, sugar beet and sweet sorghum. Biodiesel is mainly produced using a process called transesterification. This fuel is very similar to the mineral diesel and is chemically known as Fatty Acid Methyl Esters (FAME). It is commonly used in various diesel engines after blending with mineral diesel but may also be used without such blending. The well-known biodiesel feedstock crops are soyabean, sunflower, canola and groundnuts.

Currently, most commercial scale biofuels production worldwide uses first generation biofuels technologies.

3.2 Second-Generation Biofuels

Second-generation biofuels are also known as advanced biofuels, being derived from technologically advanced manufacturing methods. They differ from first-generation biofuels with regard to the fact that the feedstocks used in producing second-generation biofuels are generally not food crops. These include residual non-food parts of current crops, such as stems, leaves and husks that are left behind once the food crop has been extracted, as well as other crops that are not used for food purposes (non-food crops), such as switchgrass, grass and cereals that

bear little grain, and also industry waste such as woodchips, skins and pulp from fruit pressing. Food crops are considered as second-generation biofuels if they have already fulfilled their food purpose. For instance, waste vegetable oil is a second- generation biofuel because it has already been used and is no longer fit for human consumption.

Common second-generation feedstock include:

- Biomass: this includes a range of grasses, crop residues, etc.
- Used cooking oil: waste vegetable oil is considered a second-generation biofuels because its utility as a food has been expended.
- Solid municipal waste

Processing technologies for second-generation biofuels include thermo-chemical conversion, biochemical conversion, gasification and pyrolysis.

3.3 Third-Generation Biofuels

The term third-generation biofuels refers to the newer types of biofuel. The most well-known feedstock is algae. Previously, algae were classified as second-generation biofuels feedstock. However, when it became apparent that algae are capable of much higher yields with lower resource inputs than other feedstock, many scientists suggested that they be moved to their own category. Algae can be grown in waste water, which means they can offer secondary benefits by helping to digest municipal waste while avoiding taking up any additional land. All of the factors above combine to make algae easier to cultivate than traditional biofuels.

When it comes to the potential to produce fuel, there is currently no feedstock that matches algae In terms of yield / quantity and diversity. The list of fuels that can be derived from algae includes biodiesel, butanol, gasoline, methane, ethanol, vegetable oil and jet fuel.

4. Feedstock Requirements

Since the BIS is, amongst others, premised on the creation of jobs in the agricultural sector, it envisages the large scale use of first generation biofuels in its initial implementation. In South Africa, market assessment indicates that grain sorghum, sugarbeet, sugarcane and soyabeans are the most likely feedstocks for biofuels production. For bio-ethanol production, the use of sugarcane or sugarbeet would fall under the broad classification of 'bio-ethanol derived from sugars' whereas the use of grain sorghum would fall under the broad classification of 'bio-ethanol derived from starches'.

Table 1 below illustrates the feedstock requirements for biofuels productions from grain sorghum, sugarcane and soyabeans based on a study conducted by DoE and DAFF.

ITEM	GRAIN SORGHUM	SUGARCANE	SOYABEANS
Reference Plant capacity (m^3/annum)	158 000	125 000	113 000
Feedstock consumption (tonne/m^3)	2.4	12.5	5.4
Total feedstock required (tonne/ annum)	379 200	1 562 500	610 200
Average yield (tonne/ha)	2.8	67	2.0
Area of land required (Ha) for Reference Plant Capacity	135 429	23 320	305 100
Water supply requirement Rainfed or Irrigation			
Potential number of jobs created	4 026	693	9 070

Table 1: An illustration of feedstock requirements for biofuels production

It should be noted that sugarbeet production in South Africa has only been done as trials and therefore no data is available for its large scale production requirements. Current production and use of the other crops expected to be widely used for biofuels production is described below:

4.1 Grain Sorghum

The current total production of grain sorghum in South Africa is about 400 000 tons. It is an underutilised crop in South Africa, with about 26% used directly for human consumption; 22% for beverages; and 40% for animal feeds. The balance of the crop (12%) is used for industrial purposes as well as exports to other countries.

It is important to note that grain sorghum lost its staple food status about 50 years ago when South African consumers switched to maize. Biofuels would help this commodity to grow and increase its contribution to the overall economy of this country. Based on available suitable land, there is scope to increase production up to 700 000 tons per annum under rain-fed conditions.

4.2 Sugarcane

Sugarcane is currently planted on approximately 430 000 hectares (ha), largely in KwaZulu- Natal and Mpumalanga provinces. The South African sugar industry is relatively small by world standards. Globally, Brazil is the largest producer followed by India and China. For many years, the South African sugar industry had been producing large volumes of surplus sugar which is said to have been exported to world markets at a loss.

The sugar industry intends diverting the sugarcane equivalent of surplus sugar to the biofuels production. In other words, developing the biofuel industry will, amongst others, solve this long-standing problem that the sugar industry had been experiencing for many years. This will reduce the industry's losses and create more jobs within South Africa.

4.3 Soyabeans

South Africa produces about 900 000 tons of soyabeans. About 60% of the soyabean crop in South Africa is used for animal feeds, 30% used for cooking oil and only 7% is directly used for human consumption. The balance is used for other industrial purposes. Soyabeans and its products remain unpopular among South African consumers despite various attempts made to promote the consumption of soyabeans. The results are not encouraging due to preferences on taste and

flavour. It is therefore expected that the use of soyabeans for biofuel production will not have a negative impact on food security. Its use stands to even have a positive impact on food security as the oilcake, which is a by-product of the process of manufacturing biofuels from soyabeans, would be used as animal feed to the benefit of the livestock industry. South Africa currently imports oilcake for animal feed. The use of soyabeans for biofuels production will lead to an increase in the production of this crop and its by-products, thereby reducing the country's reliance on imported soybean products like oilcake.

5. Risk Management

Risk management is critical for the long-term viability and sustainability of the biofuels industry in South Africa. The most important risks that need to be addressed with regard to primary production of feedstock crops are food security, impact on water usage and the environment. The following sections give an indication on how these indentified risks would be mitigated.

5.1 Impact on Food Security

The use of crops as feedstock for biofuel production has always been a contentious as well as an emotive issue, especially with regard to its potential threat to food security. With regard to the biofuels industry, food security concerns mainly centre around: the risk of an inadequate supply of food / food crops for human consumption; and the risk of increases in prices of food / food crops, as result of them (or their substitutes) being used as feedstock for biofuels production. Although precautionary measures have been taken in addressing food security concerns, it remains a risk that should always be closely managed. The following principles have been adopted as a means of addressing food security concerns:

A Prohibition of the Use of Staple Crops as Feedstock

Cabinet, through the BIS, prohibits the use of maize, which is a major staple crop consumed by close to 70% of the population, for biofuels production. The use of both white and yellow maize crops is prohibited. In assessing the feedstock supply plans from prospective biofuels manufacturers, the use of any other staple crops like wheat and potatoes will result in that

feedstock supply plan not being approved. This will assist in minimising the rick of an increase of staple-crop prices as a result of biofuels production.

B. Use of Dual Purpose (Or Multiple Use) Crops

The use of crops that has multiple applications has the advantage that it enhances financial sustainability of farming enterprises as well as militating against any negative impact on food security that might arise.

In assessing the feedstock supply plans from prospective biofuels manufacturers, DAFF would favourably consider projects that use multiple-use feedstocks.

C. Targeting Under-Utilised Land

It is estimated that there is about 3 million ha fallow land in South Africa that is either underutilised or not under production. Most of this land is in communal areas in former homeland areas. There are also vast tracts of land lying fallow in commercial farming areas. Government will target these lands for production of feedstock crops.

D. Migration to Second- and Third- Generation Biofuels

The concerns around food security are mainly based on the fact that commercial scale biofuels production technologies to be used in South Africa (and currently in use globally) are applicable to first-generation feedstocks like grain sorghum, sugarcane, soyabean, etc. The migration to second- and third-generation feedstocks will focus on the use of non-food feedstock like biomass, crop residues, algae, etc. Currently the processing technologies for second- and third-generation biofuels are still mostly at a pilot phase with no commercial- scale manufacturing plant, hence the bankability of such projects is likely to be an issue. For South Africa's first phase of biofuels production, the country will still use first-generation biofuels. There is a need for increased investments in research and technology development in order for the country to keep abreast with advancements of second- and third-generation biofuels technologies and to introduce these technologies, should they be deemed beneficial, as soon as possible in the country.

5.2 Impact on Water Resources

South Africa is a water-stressed country. This is due to problems like very variable rainfall with higher rainfall in the eastern parts of the country and very low rainfall towards the western areas of the country, few perennial rivers, and high evaporation. Thus it is important that available water be used in a sustainable manner.

Government shall promote the use of drought-resistant cultivars of targeted feedstock crops. The overall drive will be to prioritise the production of biofuels feedstock crops under rain-fed conditions in order to make water available for other uses. Grain sorghum is a good example of such crops. In instances where irrigation is necessary it will be important to use low water- use irrigation systems like drip and sprinkler systems.

In reviewing the feedstock supply plans from prospective biofuels manufacturers, DAFF will favourably consider projects that can sustainably grow feedstock from rain-fed areas. Feedstock production requiring irrigation will require the necessary water-use permits from the Department of Water and Sanitation (DWS).

6. Procedure for Submitting the Biofuels Feedstock Supply Plan

As part of the prequalification criteria for the biofuels subsidy, prospective biofuels manufacturers will be required to obtain an approved biofuels feedstock supply plan from the Department of Agriculture, Forestry and Fisheries (DAFF). The following procedure will be followed by the DAFF in processing the feedstock supply plans:

a. A prospective biofuels manufacturer will submit to the DAFF its feedstock supply plan using a prescribed form as illustrated in Annexure A of this Protocol.

b. The submissions / applications will be discussed at the DAFF Biofuels Committee which will be composed of all relevant units within the DAFF and representatives from the Department of Water and Sanitation (DWS) and any other relevant State institution. The recommendation by the Committee will be forwarded to the DAFF Executive Committee (EXCO) and the Office of the Director General of DAFF for final approval.

c. The final outcome of the application will be communicated to the applicant in the form of a letter signed by the Director General of DAFF.

d. A copy of the letter from the Director General of DAFF will also be sent to the inter- ministerial Biofuels Task Team (or its delegated committee) mandated with selecting biofuels projects that will be eligible for the biofuels subsidy.

e. DAFF will maintain a database of farmers involved in the production of biofuels feedstocks.

f. DAFF will monitor the adherence of the biofuels manufacturer to the feedstock supply plan during the life of the biofuels project.

7. Criteria for the Assessment of Biofuel Feedstock Supply Plans

The DAFF Biofuels Committee will use the following criteria in its assessment of the Plans:

a. Geographic area where biofuel feedstock crops are being produced. The area should be suitable for the envisaged crop production. Annexures B, C and D attached hereto depict areas that are suitable for the cultivation of grain sorghum, sugarcane and soyabeans. Priority will be given to:

- Former homeland areas;
- Land reform farms; and
- Fallow land in commercial production areas. This land should have been fallow for at least 3 consecutive years.

b. Involvement of new farmers, particularly black farmers (DAFF's objective is the inclusion of new, black smallholder and black commercial farmers)
c. The feedstock crop to be procured
d. Quantities of feedstock needed
e. Number of new jobs created
f. Sustainability of feedstock supply

g. Impact on natural agricultural resources (preference will be rain-fed crops).

8. Mobilisation and Support of Farmers

The success of the biofuel industry will to a large extent depend on active participation of both smallholder and commercial black farmers. DAFF will work together with provinces to encourage these farmers to participate. This will be done through awareness programmes including information sharing, exhibitions, demonstrations, media (both print and electronic), etc.

One of the critical factors that will determine the sustainability of feedstock production and supply in South Africa will be the type of support systems that will be provided to farmers as outlined below:

- Production practices: DAFF and the Agricultural Research Council (ARC)
- Enterprise development: Department of Trade and Industry (DTI) and DAFF
- Funding: DAFF, Department of Rural Development and Land Reform (DRDLR), DTI, Land
- Bank, Industrial Development Corporation (IDC) and provinces
- Irrigation related matters: DWS and DAFF
- Land and related matters – DRDLR and DAFF
- Trade and marketing issues: DTI and DAFF
- Compliance with Environmental Impact Assessment (EIA) regulations: Department of
- Environmental Affairs (DEA), DAFF and the provinces.

9. Monitoring and Evaluation

The production of feedstock will be monitored on an on-going basis as part of the BTT monitoring and evaluation process of the biofuels industry.

Farmers will be expected to keep records regarding yields and harvest volumes.

Resource auditors from the Directorate: Land Use Management Scheme and Comprehensive Agricultural Support Programme (CASP) auditors from the Directorate: Smallholder Farming (or their successors in title) will undertake site visits to the biofuels feedstock producing areas. The reports from these activities will be tabled at the DAFF Biofuels Committee and provided to the BTT to be used in monitoring compliance with the Implementation Agreement to be concluded between a subsidised biofuels manufacturer and Government regarding the payment of the biofuels subsidy.

agriculture, forestry & fisheries
Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

Annexure A: Feedstock Supply Plan Application Form

Part A: Particulars of Biofuel Manufacturer & Project Site

Name of company	
Name of project	
Name of contact person	
Phone numbers of contact person	
E-mail address of contact person	
Fax number for contact person	
Physical address of proposed biofuels manufacturing plant	
GPS co-ordinates of proposed biofuels manufacturing plant site	
GPS co-ordinates of proposed biofuels manufacturing plant site	

Part B: Biofuels Production Requirements

Biofuel to be produced	
Capacity (litres) per annum	
Feedstock(s) required	
Total quantities of feedstock needed per annum	
By-products (including quantities)	
Number of employees at manufacturing plant	

Part C: Particulars of Targeted Feedstock Suppliers / Farmers

Using the table below for each of the suppliers, please provide:

Feedstock supplier/farmer number:……out of ……suppliers/farmers

Name of Farm	
Name of Farm Owner	
Telephone / Cell No.	
Location – Physical Address	
Location – GPS Coordinates	
Type of Feedstock to be supplied	
Quantity of Feedstock to be supplied	
Rain-fed or Irrigated feedstock production?	
Current Use of Farm (indicate whether it is new farm, fallow land or current crops being produced)	
Number of Employees for feedstock production – provide annual / seasonal, permanent or temporary figures if relevant. Indicate number of new employees to be contracted for the biofuels production.	

Part C: Particulars of Targeted Feedstock Suppliers / Farmers

No.	NAME OF FARM	NAME OF FARMER / OWNER	TEL / CELL NUMBER OF FARMER	LOCATION		IRRIGATED or RAINFED	QUANTITIES (Tons / annum)	Number OF EMPLOYEES Current and new
				LOCAL MUNICIPALITY	GPS CO-ORDINATES			
1.								
2.								
3.								
4.								
……..								
GRAND TOTAL								

Additional Information:

Are there any farmers that are going to be using virgin land or fallow land for production of feedstock crops?		If yes, please provide the details.
Yes	No	
Was there any land diverted from producing other food crops?		If yes, please provide the details.
Yes	No	

Part D: Undertaking On Representation Made Herein:

The information provided in this Feedstock Supply Plan is to the best of my knowledge correct. I consent to DAFF or the BTT verifying the information and any misrepresentation may lead to the project being disqualified from being considered for the biofuels subsidy.

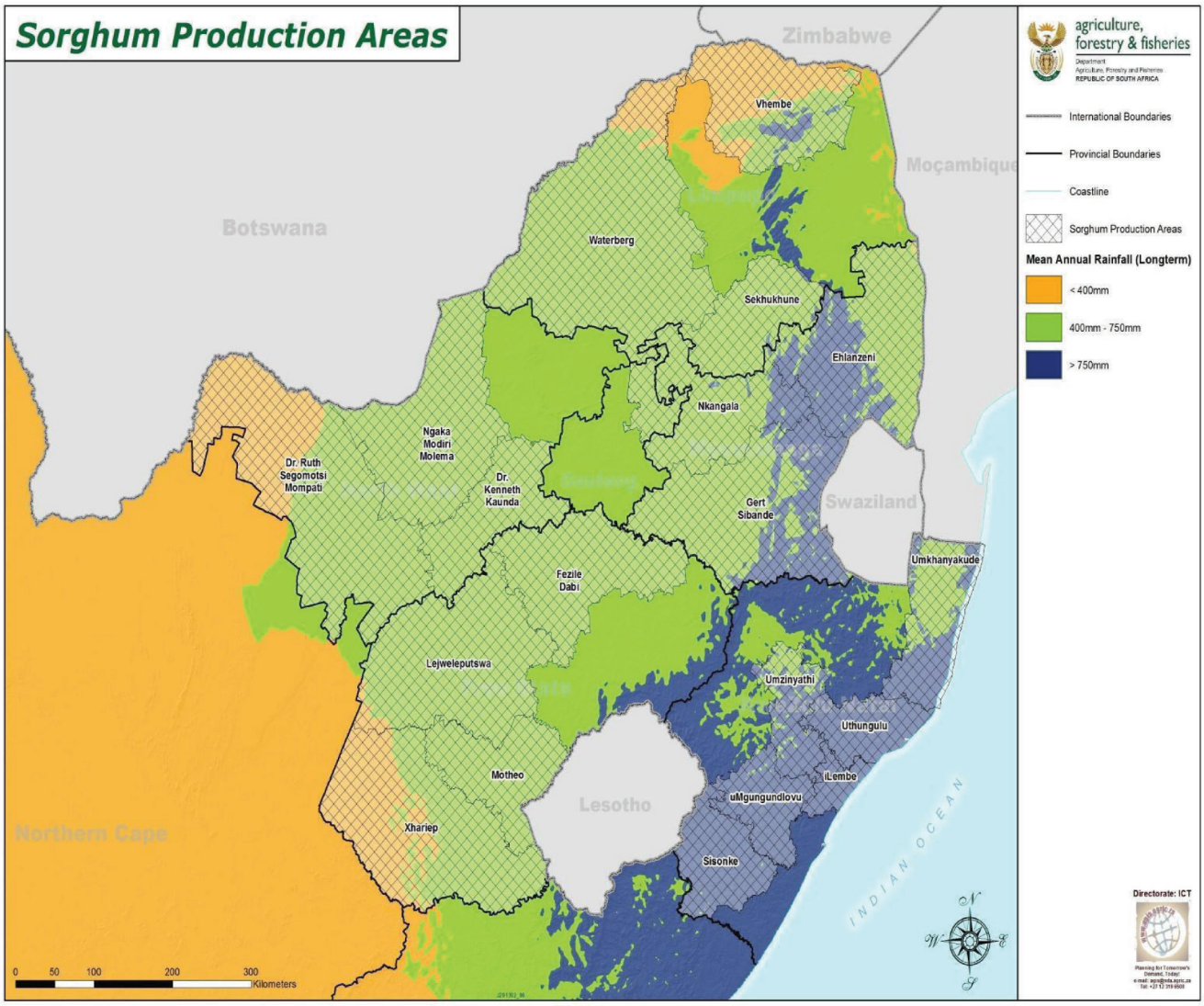
Name of person submitting:…….. …….. Position in

the Company / Project:…….. …….. Signature:….

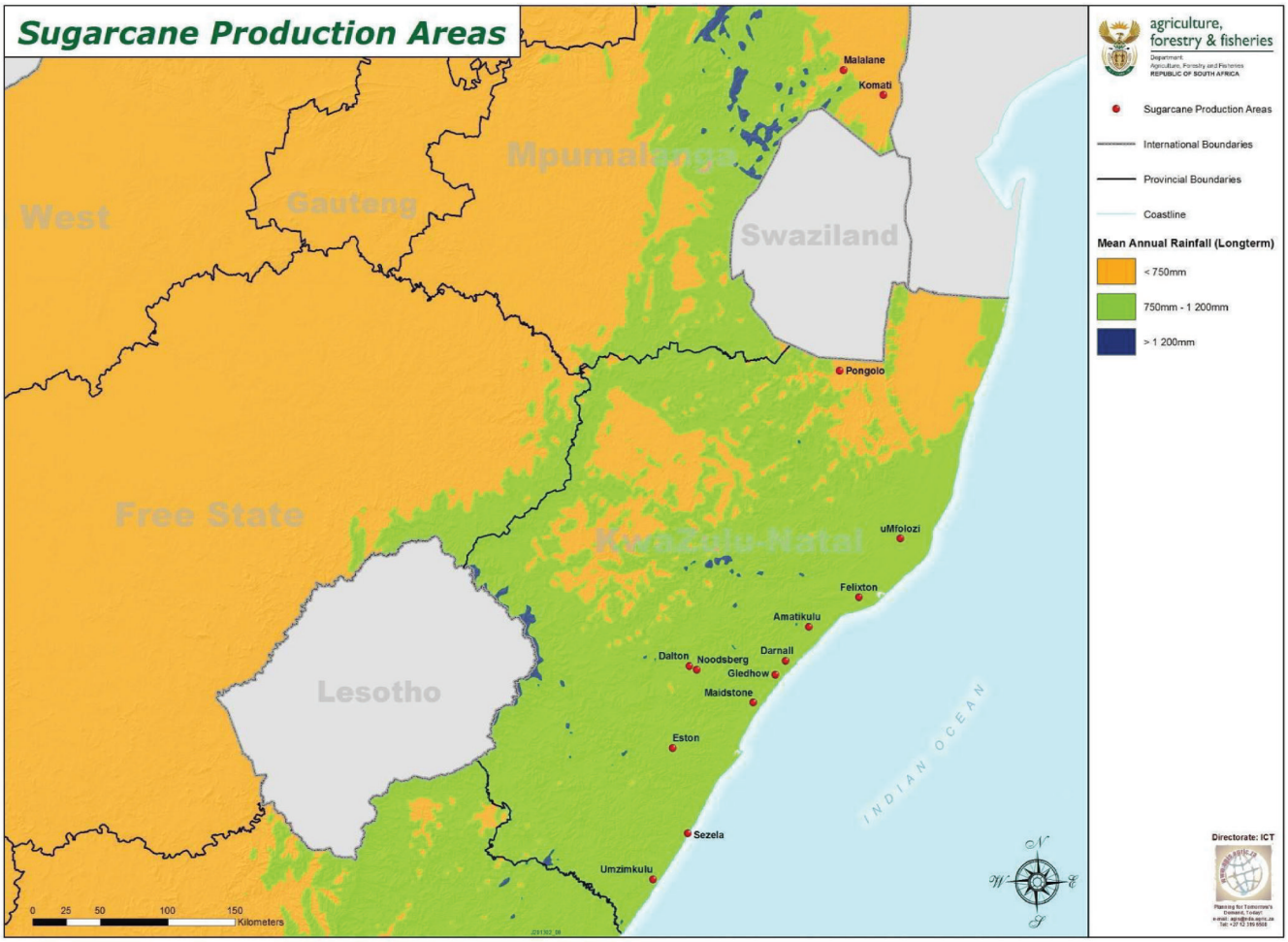
…..... …….. Date Signed: .....

Place:…….....

Annexure B: Suitable Production Areas for Grain Sorghum



Annexure C: Suitable Production Areas for Sugarcane



Annexure D: Suitable Production Areas for Soya Beans