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MPhil Marine and Environmental Law

TRANSLATING POLICY INTO LAW:

A Critical Review of South Africa's Emerging Legal Framework Governing Biofuels

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I hereby declare that I have read and understood the regulations governing the submission of MPhil Marine and Environmental Law dissertations, including those relating to length and plagiarism, as contained in the rules of this University, and that this dissertation conforms to those regulations.

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Abstract

There exists a sense of global urgency in the rapid growth of biofuel policy documents. This urgency is especially apparent over the past decade. This is as a result of the shift to incorporate renewable energies into the generation sector to further instil the principles of sustainable development. Biofuels remain a controversial issue drawing both protagonists and antagonists in the debate around agriculture. Notwithstanding this dispute, many countries have moved to integrate biofuels as an essential component in their energy blend. As a result of this controversy and their many potential impacts on other key sectors, most notably agriculture, stringent legal frameworks need to be introduced to regulate the biofuels industry. Several countries have already introduced legal frameworks of this nature. The advance of biofuels offers developing countries a perspective of self-security and valid economic stature at both the national and international levels. South African policy makers have indicated that biofuels will form an integral component of the country's future energy sector. This has been done through the release of the *Biofuels Industrial Strategy of the Republic of South Africa* (*Industrial Strategy*) in 2007, followed by the *Draft Position Paper on the South African Biofuels Regulatory Framework* (*Position Paper*) published in January 2014. The *Position Paper* outlines the key elements of the country's anticipated legal regime governing biofuels. It forms the focus of this dissertation that seeks to critically review South Africa's future legal framework governing biofuels. This dissertation serves to determine whether or not the future policy contains the necessary components which appear to underlie successful biofuel regimes, namely: an identification of the different types of fuels and their products; provisions for mandatory blending; licensing and permits; identification of reference crops; pricing schemes; incentives and criteria for the eligibility of government support; environmental management; and institutions. The critical review of the *Position Paper* is done utilising the plethora of South African legislation that highlight the move towards sustainable living. An array of policy documents with varying focuses such as fiscal directives and climate change mitigation is drawn from to effectively review the future legal biofuels regime in South Africa. Existing legislation is used in the critique to address the mechanisms from which the future framework will acquire governing support. This dissertation discusses the individual elements of the future regime and whether they suffice as effective regulatory tools in a legal biofuel framework, and if not, changes the regime should implement to do so.

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List of Abbreviations/Acronyms

Biodiversity Paper	*White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity*
Blending Regulations	Regulations Regarding the Mandatory Blending of Biofuels with Petrol and Diesel
BTT	Biofuels Task Team
CDM	Clean Development Mechanism
CEA	Customs and Excise Act
DME	Department of Minerals and Energy
DoE	Department of Energy
DST	Department of Science and Technology
ECA	Environment Conservation Act
EMP	Environmental Management Plan
Energy Paper	*White Paper on the Energy Policy of the Republic of South Africa*
Industrial Strategy	*Biofuels Industrial Strategy of the Republic of South Africa*
Integrated Plan	*Draft Integrated Energy Planning Report*
IRP	*Integrated Resource Plan for Electricity 2010-2030*
JPoI	*Johannesburg Plan of Implementation*
Kyoto Protocol	Kyoto Protocol to the United Nations Framework Convention on Climate Change
MPRDA	Mineral and Petroleum Resources Development Act
NEMA	National Environmental Management Act
NERA	National Energy Regulator Act
NERSA	National Energy Regulator of South Africa
NTSP	*National Treasury Strategic Plan*
PFMA	Public Finance Management Act
Pipelines Act	Petroleum Pipelines Act
Pipelines Regulations	Petroleum Pipelines Regulations
Position Paper	*Draft Position Paper on the South African Biofuels Regulatory Framework*

PPA	Petroleum Products Act
Pricing Framework	Biofuels Pricing Framework
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
Renewable Paper	*White Paper on Renewable Energy*
RETs	Renewable Energy Technologies
SADC	South African Development Community
SANS	South African National Standards
SARS	South African Revenue Services
Standards Regulations	Regulations Regarding Petroleum Products Specifications and Standards
Subsidy Scheme	*Renewable Energy Capital Subsidy Scheme*
Technology Audit	*Technology Audit of the Transport Fuels Sector in South Africa*
The Bureau	South African Bureau of Standards
UNFCCC	United Nations Framework Convention on Climate Change
WSSD	World Summit on Sustainable Development

Chapter 1: Introduction

1.1. Context

The natural cycles of life are made up of continuous processes.[1] Energy is constantly transforming itself through these conversions.[2] Civilisation has evolved and expanded due to increasing dependence on the harvesting of different energy techniques.[3] Energy can therefore be described as an indispensable factor in the development of economic growth.[4]

Energy plays a critical role in the development of a country.[5] Primarily, energy is utilised domestically, however its resultant cost as a factor of production highlights it as a global necessity.[6] Energy affects all the major facets of development, namely social, economic, and environmental.[7] The effects go further still, encompassing livelihoods, well-being and health, access to water, education, population levels, agricultural productivity, and gender-related issues.[8] Hence, access to energy is a core factor in economic development.[9]

Securing energy access not only benefits the economic well-being of a country, but also provides vital services which improve the quality of life for

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[1] Mohamed A & Lee K "Energy for Sustainable Development in Malaysia: Energy Policy and Alternative Energy" 2006 (34) *Energy Policy* 2388.
[2] Ibid.
[3] Ibid.
[4] Rogner H-H & Popescu A "An Introduction to Energy" 2001 in *UNDP World Energy Assessment: Energy and the Challenge of Sustainability* 31.
[5] Amigun B, Sigamoney R & von Blottnitz H "Commercialisation of Biofuel Industry in Africa: A Review" 2008 (12) *Renewable and Sustainable Energy Reviews* 691.
[6] New Partnership for Africa's Development (NEPAD) *Communiqué Issued at the End of the Meeting of the Implementation Committee of Heads of State and Government on the New Partnership for Africa's Development, Abuja, Nigeria*l 23 October 2001.
[7] Amigun et al 2008 *RSER* 691.
[8] Ibid.
[9] Singh K & Sooch S "Comparative Study of Economics of Different Models of Family Size Biogas Plants for State of Punjab, India" 2004 (45) *Energy Conversion and Management* 1330.

citizens.[10] Striving towards the improvement of life and well-being is the engine that drives economic progression.[11]

The production of energy can significantly contribute to environmental degradation.[12] Environmental issues such as air pollution,[13] loss of biodiversity,[14] and the global threat of climate change, are just a few of the most renowned concerns.[15]

Environmental issues pose increasingly difficult challenges on energy supply and usage.[16] Questions have been raised as to whether energy production can be regulated to incorporate an approach to mitigate environmental problems, specifically climate change.[17]

The current state of energy worldwide is not promising.[18] Fossil fuels remain the core resource from which global energy use stems.[19] This is despite efforts to shift energy reliance to include renewable means.[20] The demand for fossil fuels is expected to continue for the next decade unless growth in the natural gas sector increases.[21]

Ensuring the provision of efficient, affordable, sustainable, and reliable energy services is pivotal for development within a nation.[22] Moreover, for developing countries where current energy demands are not being met, securing energy access is crucial.[23] The crux of obtaining energy supply is the need for high quality services to be met while having the least

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[10] Ibid.
[11] Ibid.
[12] Mohamed & Lee 2006 *EP* 2388.
[13] Ibid.
[14] Amigun B, Musango J & Stafford W "Biofuels and Sustainability in Africa" 2011 (15) *Renewable and Sustainable Energy Reviews* 1363.
[15] Mohamed & Lee 2006 *EP* 2388.
[16] Winkler H "Energy Policies for Sustainable Development in South Africa" 2007 (11) *Energy for Sustainable Development* 26.
[17] Ibid.
[18] International Energy Agency 2014 *World Energy Outlook: Executive Summary* 1.
[19] International Energy Agency 2014 *World Energy Investment Outlook: Special Report* 52.
[20] Ibid.
[21] International Energy Agency 2010 *World Energy Outlook* 47.
[22] Amigun et al 2008 *RSER* 691.
[23] Ibid.

environmental impact.[24] This necessity highlights the importance of complete sustainability when considering energy sources.

Cleaner and more efficient use of energy is required with the current state of natural resources.[25] Petrochemical sources such as crude oils, coal, and natural gases are finite resources.[26] These reserves are estimated to be depleted in approximately fifty years' time if the present rate of consumption continues.[27] Therefore, those countries that lack the necessary means to sustain themselves are facing major crises in the near future.[28]

Methods to integrate the development of renewable energy sources far surpass that of fossil fuels when practical and environmental attributes are considered.[29] Rapidly growing fossil fuel consumption in the transport sector alone has accelerated greenhouse gas emissions.[30] Utilising renewable sources lowers environmental damage probability.[31] Low-carbon energy technologies can be deployed quicker than those that endanger the natural environment.[32] As a result, access to affordable and sustainable energy supply is currently a central focus.[33]

Gaining access to sustainable and affordable energy is a prerequisite in achieving security in a nation, and instrumental in demonstrating its progress towards socio-economic development.[34] The inability to provide

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[24] Ibid.
[25] Winkler 2007 *ESD* 29.
[26] Srivastava A & Prasad R "Triglycerides-based Diesel Fuels" 2000 (4) *Renewable and Sustainable Energy Reviews* 111.
[27] Sheehan J, Cambreco V, Duffield J, Garboski M & Shapouri H *An Overview of Biodiesel and Petroleum Diesel Life Cycles* 1998 A Report by US Department of Agriculture and Energy 5.
[28] Demirbas A H & Demirbas I "Importance of Rural Bioenergy for Developing Countries" 2007 (48) *Energy Conversion and Management* 2387.
[29] *WEO* 47.
[30] Ajanovic A "Biofuels versus Food Production: Does Biofuels Production Increase Food Prices?" 2011 (36) *Energy* 2070.
[31] *WEO* 47.
[32] Ibid.
[33] Amigun et al 2011 *RSER* 1361. This forms one of the Millennium Development Goals (MDGs). See further *The Millennium Development Goals Report* 2014 United Nations. MDGs came about through the Millennium Declaration to relieve poverty. They are a pledge to uphold the core principles that substantiate life: human dignity, equity and equality.
[34] Ibid.

solid and reliable energy services places major constraint on a country's development.[35] This is especially true for developing countries.[36]

Developing nations constantly strive towards attaining energy security.[37] This often contributes to environmental degradation and hinders mitigation processes.[38] In Southern Africa, developing countries are suffering from a major energy crisis.[39] South Africa is a prime example of this struggle towards achieving both energy and food security in a sustainable manner, while faced with numerous constraints.[40] South Africa is facing the worst energy scenario in its history.[41] This is owed to energy production constraints, poor infrastructural planning, and the global escalation of oil prices.[42]

Given the continuous debate related to the country's ongoing reliance on coal-based power,[43] perhaps biofuels hold one of the keys to diversifying the energy mix, and reducing reliance on unsustainable forms of energy.[44] South Africa is one of three countries in Africa to clearly advocate biofuels as part of its future energy mix.[45]

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[35] Ibid.
[36] Ibid.
[37] Ibid at 1360.
[38] Arndt C, Benfica R, Tarp F, Thurlow J & Uaiene R "Biofuels, Poverty, and Growth: A Computable General Equilibrium Analysis of Mozambique" 2010 (15) *Environment and Development Economics* 104.
[39] Chakauya E, Beyene G & Chikwamba R "Food Production needs Fuel too: Perspectives on the Impact of Biofuels in Southern Africa" 2009 (105) *South African Journal of Science* 174.
[40] South Africa has numerous production constraints on energy generation and poorly planned infrastructure for the production of resources such as energy. See further: Chakauya et al 2009 *SAJS* 174; and Amigun et al 2011 *RSER* 1361.
[41] Chakauya et al 2009 *SAJS* 174.
[42] Ibid.
[43] South Africa's long-run dependence on coal-based power is analysed in light of the future move towards cleaner energies. See further: Menyah K & Wolde-Rufael Y "Energy Consumption, Pollutant Emissions and Economic Growth in South Africa" 2010 (32) *Energy Economics* 1374-1382.
[44] Hodas D "Law, the Laws of Nature and Ecosystem Energy Services: A Case of Wilful Blindness" 2013 (16) *Potchefstroom Electronic Law Journal* 101.
[45] Amigun et al 2011 *RSER* 1362. Amigun et al lists the only three countries in Africa to move beyond the first stage of biofuel development: Mozambique, see further Arndt et al 2010 *EDE* 82; Zimbabwe, see further Jingura R, Matengaifa R, Musademba D & Musiyiwa K "Characterisation of Land Types and Agro-ecological Conditions for Production of *Jatropha*

The challenge for South Africa has been the need to develop energy policies that will result in an energy generation sector that is economically, socially, and environmentally sustainable.[46] South Africa's predominant reliance on a non-renewable resource has led to extreme spikes in CO_2 emissions over the past few decades.[47]

Steadily South Africa is moving away from this heavy coal dependency and towards a more sustainable power supply.[48] Thus far however, the country is severely limited due to the lack of supporting instruments to effectively implement renewable techniques and development.[49]

Recently, there has been increased global interest surrounding the prospect of renewable energy technologies (RETs).[50] More specifically, this interest is on fuels to supplement the transport sector in hope to reduce carbon impact.[51] RETs offer developing nations a vision of securing self-reliant energy supplies.[52] Opportunities for growth exist around renewable energy generation, solar water manufacturing, and the production of biofuels.[53]

A key policy option for integrating RET forms into regulation focuses on liquid fuels.[54] These fuels are proposed to be implemented specifically to supplement the transport sector.[55] Liquid fuels, known as biofuels, have been

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as a Feedstock for Biofuels in Zimbabwe" 2011 (35) *Biomass and Bioenergy* 2081; and South Africa (2011).

[46] Winkler 2007 *ESD* 26.

[47] Ibid.

[48] Ibid.

[49] Federal Ministry for Economic Cooperation and Development *Legal Frameworks for Renewable Energy: Policy Analysis for 15 Developing and Emerging Countries* 2012 GIZ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH 101.

[50] Ajanovic 2011 *Energy* 2070.

[51] Ibid.

[52] Biswas W, Bryce P & Diesendorf M "Model for Empowering Rural Poor Through Renewable Energy Technologies in Bangladesh" 2001 (4) *Environmental Sciences and Policy* 334.

[53] Rogerson C "Reframing Place-based Economic Development in South Africa: The Example of Local Economic Development" 2014 (24) *Bulletin of Geography, Socio-Economic Series* 209.

[54] Winkler 2007 *ESD* 29.

[55] Ibid.

the subject of many a debate.[56] Subsequently, biofuels have aroused noteworthy arguments both for and against biofuel introduction into the RET generation.[57]

Biofuels are a form of energy derived from plant material, taken from original plant biomass, and reformulated to be harvested as a renewable energy source.[58] Biofuels can be broadly defined as a solid, liquid, or gas derivation of fuel taken partially or wholly from biomass.[59]

There exist five different biofuel forms.[60] Currently, only three of the five are operational on a global scale.[61] South Africa is focusing its attention on two liquid forms, biodiesel and bioethanol.[62] Although considered a controversial issue, the development of biofuels has attracted substantial interest amongst policymakers and development practitioners.[63]

Bioethanol is a fermentation product of a combination of starches and sugars.[64] It is then distilled to reach its fluid form.[65] Bioethanol can be made from a wide variety of sugar products.[66] Its substrates can be broken down to: ethyl alcohol (ethanol) extracted via biological fermentation of sugars and

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[56] Chakauya et al 2009 *SAJS* 174.
[57] The controversy is mainly through greenhouse gas reductions competing with food production as biofuels potentially threaten food security. See further Nasterlack T, von Blottnitz H & Wynberg R "Are Biofuel Concerns Globally Relevant? Prospects for a Proposed Bioethanol Project in South Africa" 2014 (23) *Energy for Sustainable Development* 1.
[58] Agbor V, Cicek N, Sparling R, Berlin A & Levin D "Biomass Pre-treatment: Fundamentals toward Application" 2011 (29) *Biotechnology Advances* 676.
[59] Letete T "Multiobjective Modelling of Biofuel Supply Systems" 2009 MSc Thesis *Chemical Engineering* University of Cape Town 8.
[60] The five biofuel forms: bioethanol, biodiesel, biogas, biomethanol, and biohydrogen. See further Amigun et al 2011 *RSER* 1361.
[61] Ibid. Only bioethanol, biodiesel, and biogas are currently in operation across the globe.
[62] Ibid. Bioethanol and biodiesel are the most established biofuels. Produced using existing methods, agricultural practices and infrastructure, they are considered one of the most renewable energy forms with the potential to substitute current non-renewable energy sources.
[63] Ibid.
[64] Wilkinson J, Afiff S, Cariquiry M, Jumbe C & Searchinger T *Biofuels and Food Security VO Draft – A Zero-draft Consultation Paper* 9 January 2013 Submitted by the *Committee on World Food Security: High Level Panel of Experts on Food Security and Nutrition* to open electronic consultation 16.
[65] Ibid.
[66] Amigun et al 2011 *RSER* 1361.

starches from various plants.[67] It can be cultured from an array of raw materials in numerous African countries due to the tropical climate.[68] Bioethanol can be used unblended as fuel for modernised alcohol-fuelled machinery; it can be blended with petroleum which appears to be the desired approach; or it can be used in select vehicles as a petrol in hydrous ethanol form.[69]

Biodiesel, on the other hand, is created through a much more complicated process of refining and esterification.[70] Produced via a chemical process known as transesterification, biodiesel is essentially a long chain of fatty acids.[71] The most common source for biodiesel production is vegetable oil, namely rapeseed, sunflower, palm, and soybean.[72] There are three known methods in which biodiesel can be utilised.[73] One method is directly in its neat biodiesel form.[74] However, biodiesel in this form is at its highest level of intensity and may accelerate fuel pipe degradation.[75] Like bioethanol, another method for biodiesel is to incorporate it as a blend.[76] Blending with petroleum diesel reduces emission amount and cost of biodiesel production.[77] It also improves engine performance, and minimises damage

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[67] Ibid.
[68] Jumbe et al 2009 *EP* 4983.
[69] Letete "Modelling" 9. The distinction between anhydrous and hydrous is important in the field of ethanol. Anhydrous alcohols contain no water and are almost completely pure at 99 per cent. Hydrous alcohol has water in its constituents, with 96 per cent purity. Only anhydrous ethanol can be used in fuel blends, while hydrous alcohol is being utilised as a 100 per cent gasoline substitute. See further Berg C *World Fuel Ethanol Analysis and Outlook* 2004 Kent, UK.
[70] *Biofuels and Food Security* 16.
[71] Transesterification is defined as an organic chemistry process where an ester group (triglyceride), either in the form of animal fat or vegetable oil, exchanges with an alcohol group, in ethanol form, in the presence of a base catalyst. It forms a long chain of fatty acids, a monoalkyl ester. See further: Demirbas & Demirbas 2007 *ECM* 2394; and Nolte M "Commercial Biodiesel Production in South Africa: A Preliminary Economic Feasibility Study" 2007 MSc Thesis *Chemical Engineering* University of Stellenbosch 8.
[72] Letete "Modelling" 9.
[73] Nolte "Biodiesel" 16.
[74] Ibid. This pure form is known as B100. Neat biodiesel allows the petrofuel maximum reduction, i.e. hydrocarbons remain unburned with minimal carbon monoxide and sulphur dioxide emissions resulting from its.
[75] Ibid.
[76] Ibid at 17. The range of blending of biodiesel into petroleum biodiesel is anything from 5-50 per cent. It is known as B05, B10, and so on, according to its percentage.
[77] Ibid.

on fuel lines.[78] The third method for biodiesel is use as an additive.[79] Biodiesel has tested to be especially effective as a lubricity enhancer,[80] typically in low amounts between 1-2 per cent.[81] Biodiesel as an additive has the potential to convert a poor fuel to an acceptable one.[82] The sustainable production of biodiesel in particular results in an effective zero-carbon fuel.[83]

Biofuels are regarded as one integral component of the RET evolution.[84] The effective implementation of biofuel production within a developing country has the potential to provide the entire nation with self-reliant energy sources.[85] A further advantage of biofuel operation is the environmentally sensitive nature of production.[86] The implementation of biofuel production can significantly lower the amount of greenhouse gas emissions.[87]

There exists an optimistic attitude when dealing with the future for renewable energy,[88] specifically for the production of biofuels.[89] Advances in technology and methods of production are responsible for this optimism.[90] However, it is imperative that political efforts are sustained in order to

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[78] Letete "Modelling" 9.
[79] The additive form of biodiesel is known as B01 or B02. With the percentages being so low, the impact is minimal on fuel and engine emissions. However, the advanced lubricity allows for a weak fuel to be converted to an adequate fuel at a lower cost. See further: Nolte "Biodiesel" 17; and Friedrich S "A Worldwide Review of the Commercial Production of Biodiesel – A Technological, Economic and Ecological Investigation Based on Case Studies" 2004 *Masters Thesis* Institute fur Technologie and Nachhaltiges Produktmanagement Vienna, Austria.
[80] Nolte "Biodiesel" 17.
[81] Ibid.
[82] Ibid.
[83] Zero-carbon is the result of releasing no amount of carbon dioxide into the environment. See further Winkler 2007 *ESD* 29.
[84] Bindraban P, Bulte E & Conijn S "Can Large-scale Biofuels Production be Sustainable by 2020?" 2009 (101) *Agricultural Systems* 197.
[85] Amigun et al 2011 *RSER* 1361.
[86] Nigam P & Singh A "Production of Liquid Biofuels from Renewable Resources" 2011 (37) *Progress in Energy and Combustion Science* 53.
[87] Amigun et al 2011 *RSER* 1361. See further Sustainable Development Commission 2006 *Response to the Department for Transport on Biofuels and the Renewable Transport Fuels Obligation* 2.
[88] *WEO: Summary* 1.
[89] Winkler 2007 *ESD* 29.
[90] *WEO: Summary* 1.

effectively shift energy usage trends towards cleaner methods.[91] The distribution of a detailed set of guidelines that are sound in instruction and carry weight with enforcement is key to the longevity of not only biofuel implementation, but renewable energy as a whole.[92]

Several developed and developing nations have introduced legal biofuel policies and consider biofuels as integral components of their energy mix.[93] The integration of these policies is to further enable and promote the generation of biofuels into the development of RETs.[94]

It is important to identify that relevant policies span many different sectors,[95] including but not limited to: energy, climate change, finance, and environmental management.[96] Translating biofuel production from promotion through varying policies into substantiated law is no mean feat. The goals of the law need to be specific and take into account the country's economic position.[97] A threefold approach to the integration of a biofuels mandate in South Africa would be most beneficial.[98] Firstly, the aim of achieving true security through energy self-sufficiency; secondly, the overall protection and

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[91] Ibid.
[92] Ibid.
[93] Alvarez J "Biofuels Act: Fueling the Present at the Expense of the Future – Generational Genocide in Progress?" 2009 (53) *UST Law Review* 120.
[94] Demand for biofuels is increasing significantly across the globe. Particularly through more industrialised countries: Canada, Germany, New Zealand, and the USA. See further: Prasad S, Singh A, Jain N & Joshi H "Ethanol Production from Sweet Sorghum Syrup for Utilization as Automotive Fuel in India" 2007 (21) *Energy Fuel* 2415; Prasad S, Singh A, Jain N & Joshi H "Ethanol as an Alternative Fuel from Agricultural, Industrial and Urban Residues" 2007 (50) *Resources, Conservation and Recycling* 2; Amigun et al 2008 *RSER* 692; Jumbe C, Msiska F & Madjera M "Biofuels Development in Sub-Saharan Africa: Are the Policies Conducive?" 2009 (37) *Energy Policy* 4981; Naik S, Goud V, Rout P & Dalai A "Production of First and Second Generation Biofuels: A Comprehensive Review" 2010 (14) *Renewable and Sustainable Energy Reviews* 579; and Schaffel S & La Rovere E "The Quest for Eco-social Efficiency in Biofuels Production in Brazil" 2010 (18) *Journal of Cleaner Production* 1663.
[95] Glazewski J *Environmental Law in South* Africa 2 ed 2005 Lexis Nexis, Durban 487.
[96] See further: Winkler 2007 *ESD* 7; and Edkins M, Marquard A & Winkler H *South Africa's Renewable Energy Policy Roadmaps* 2010 Energy Research Centre, submitted for the United Nations Environment Programme Research Project: *Enhancing Information for Renewable Energy Technology Deployment in Brazil, China and South Africa* 3.
[97] Alvarez 2009 *LR* 128.
[98] Ibid.

conservation of our living environment; and lastly, the improvement of agriculture and food production as a consequence of biofuel production.[99]

Living within environmental limits is our reality.[100] RETs aim development in a promising direction that does not exceed this reality.[101]

Advocating for biofuels through policy and into law utilises these environmental limits as objectives for its introduction.[102] National Energy White Papers have included targets to greatly reduce carbon dioxide emissions by 2050, through biofuel implementation.[103] International agreements such as the United Nations Framework Convention on Climate Change (UNFCCC) have orchestrated similar commitments for the reduction of greenhouse gases.[104]

The first tangible effort South African government officials made in the implementation of biofuel policy was with the *Biofuels Industrial Strategy of the Republic of South Africa*[105] (*Industrial Strategy*) in 2007. The focus of the *Industrial Strategy* was to address the prevailing issue of poverty and weak economic development in the country.[106] The goal was to create a balance between subsistence and commercial farming areas, utilising the sustainable development of biofuels to do so.[107]

The *Industrial Strategy* was designed on a five year short-term focus with specific percentage targets to infiltrate the national liquid fuel supply.[108]

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[99] Ibid.
[100] *Response* 12.
[101] Ibid at 2.
[102] Ibid.
[103] Ibid at 12. For example: *White Paper on Renewable Energy* 2003 Department of Minerals and Energy, Republic of South Africa; of which does not specifically identify biofuels as the means through which renewable energy will be integrated, however it does not discredit biofuels either.
[104] The UNFCCC committed to a 12.5 per cent reduction in greenhouse gas emissions from 1990 to 2012. United Nations Framework Convention on Climate Change 1992 United Nations, Geneva, Switzerland; see further *Response* 12.
[105] *Biofuels Industrial Strategy of the Republic of South Africa* 2007 Department of Minerals and Energy, Republic of South Africa.
[106] Ibid at 8.
[107] Ibid.
[108] Ibid at 3.

Following the lapse of the *Industrial Strategy*, the Department of Energy (DoE) developed, in terms of the National Energy Act of 2008,[109] the *Draft Position Paper on the South African Biofuels Regulatory Framework*[110] (*Position Paper*) in January 2014. The purpose of the *Position Paper* is to expand on the *Industrial Strategy* with the aim of finalising the legal framework.[111]

1.2. Aim, Purpose and Methodology

The emerging regulatory framework for biofuel production in South Africa has been given significant momentum through the recent publication of the *Position Paper*. The *Position Paper* outlines the proposed structure for biofuels regulation in South Africa and will consequently form the basis of this analysis.

The time is ripe to critically reflect on the current state and potential future form of South Africa's legal framework. As already mentioned, there is an animated debate that exists over the development of biofuels. Notwithstanding these disputes, this dissertation does not serve to address these debates, but rather to critique the proposed framework for biofuels regulation in South Africa.

The purpose of this dissertation is two-fold. Firstly, it serves to survey domestic policies of relevance to biofuel production in South Africa. This includes a wide range of regulatory policies across varying sectors. Secondly, to critically analyse the extent to which South Africa's legal framework gives effect to the policies relevant to biofuel production. Ultimately the question will be: whether the current regime proposed for the future governance of biofuels development and regulation in South Africa

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[109] National Energy Act (No. 34 of 2008) Republic of South Africa.
[110] *Draft Position Paper on the South African Biofuels Regulatory Framework* (Notice 24 of 2014) GG No. 37232 Department of Energy, Republic of South Africa.
[111] Ibid at 9.

possesses the necessary elements to be effective? And if not, then what practices are to be instilled to adapt the framework to do so?

The research methodology for this dissertation involves an analysis of available information and literature on the subject of biofuel production and the legislation that regulates it. It is a critical analysis of the future South African biofuels regulatory policy, and a desktop study covering a critical reflection of the various current policies that support biofuel production. The academic review is conducted through the use of journals, government publications, books, internet sources, relevant laws and policies, as well as various reports and institutional documents.

The relevant themes dissected for critical review have been drawn from the *Position Paper*, as it is the skeleton from which the future legal framework will develop. The *Position Paper* builds on what the *Industrial Strategy* defined, therefore this dissertation applies both throughout the critique, to aid in distilling the elements of the theoretical legal matrix.

1.3. Structure

This dissertation is divided into three main parts. The first part, Chapter 2, seeks to provide a broad overview of the domestic policies relevant to biofuel production in South Africa. This will be done through building a structure of policies that have exhibited the promotion of biofuels.

The second part of the dissertation, Chapter 3, draws from existing legislation that integrates regulatory elements into their scope. Chapter 3 seeks to critically review the extent to which South Africa's legal framework contains the necessary tangible mechanisms to give effect to the goals and structures reflected in the policies identified in Chapter 2. The following elements have been identified as integral components of the future biofuels regime for South Africa: the identification of biofuel types and products; prescription of mandatory fuel blending; creation of licensing and permitting regimes for producers; identification and use of reference crops;

establishment of pricing schemes; use of incentives and support mechanisms to encourage production; mechanisms created to manage environmental impacts; and the establishment of key institutions to oversee different components and impacts associated with production. These key elements will be unpacked in Chapter 3.

Chapter 3 serves to outline the existing policy regulation for biofuels governance in South Africa. It also seeks to analyse through the identified elements, whether the existing legal framework gives effect to the identified element.

Finally, the third part of the dissertation, Chapter 4, provides the conclusion. Drawing from the analysis done in Chapter 3, Chapter 4 will summarise the essential legal reform required to be implemented into South Africa's legal biofuel framework. This is to give effect to the elements identified in the overarching policy regime, and how best to effectively translate South Africa's biofuel policy into an established law.

Chapter 2: Policy Context

Clear policy regulations are a pre-requisite for the developmental growth of the biofuels industry.[112] Concise guidelines and regulatory incentives assist biofuel production in competing against the volatile oil sector.[113]

Long-standing policies exist, both internationally and domestically, that promote the establishment of RET frameworks through their regulation.[114] Although renewable energy generation is in a juvenile stage in South Africa,[115] there are a number of these policies governing different sectors.[116] The promotion of biofuel integration and development can be identified within a few of these policies.

In order to dissect the principal elements that substantiate a legal biofuels framework, it is necessary to identify the driving forces responsible for the growth in biofuel production.[117] Furthermore, this understanding could provide a basis to shape further policies.[118]

As previously stated, these policies belong to varying sectors and are not specific to energy or environmental matters.[119] The drivers for the promotion of biofuels by governments can generally be summarised as: climate change; job creation within the agricultural sector; energy security; and renewable resource potentials.[120] These drivers have been identified in

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[112] *Industrial Strategy* 5.
[113] Ibid.
[114] Renewable Energy Technology Review "Appendix E: International Renewable Energy Policies" 2013 Available at: http://retreview.dpme.gov.au?appendix-e-international-renewable-energy-policies [accessed 15.06.15].
[115] Barton J *Intellectual Property and Access to Clean Energy Technologies in Developing Countries: An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies* 2007 ICTSD Trade and Sustainable Energy Series Issue Paper No. 2. International Centre for Trade and Sustainable Development, Geneva, Switzerland 11.
[116] Edkins et al 2010 *REPR* 1.
[117] Sorda G, Banse M & Kemfert C "An Overview of Biofuel Policies across the World" 2010 (38) *Energy Policy* 6977.
[118] Ibid.
[119] Refer 1.1. at 9.
[120] Charles M, Ryan R, Ryan N & Oloruntoba R "Public Policy and Biofuels: The Way Forward?" 2007 (35) *Energy Policy* 5739.

successful biofuel policies in the European Union[121] (EU), as they identify and target socio-economic benefits that biofuel production presents.[122]

The varying socio-economic stances between South Africa and the much more developed EU are not disregarded. However, a number of key focus points reveal themselves when dissecting existing developed nation policies. These focus points can be found embedded within domestic policies that do not specifically tackle biofuel production within South Africa.

Policies assist in the establishment of law. In 2002 South Africa hosted the World Summit on Sustainable Development[123] (WSSD), which resulted in the *Johannesburg Plan of Implementation*[124] (JPoI).[125] The JPoI commits South Africa to a future of developing new technologies for the production of renewable energy, which includes biofuels.[126]

In 2009, a report on the development of the biofuel programme in South Africa admitted that progress was at that point modest.[127] Up until then, minimal investment had been put into the movement.[128] Currently, only a handful of biofuel policies are operational within Africa.[129] The fruition of these has been in response to the global promotion of biofuels.[130] South Africa is currently leading the continent in development of advanced technologies required for large-scale productions such as biofuel.[131]

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[121] Faaij A "Bio-energy in Europe: Changing Technology Choices" 2006 (34) *Energy Policy* 322.
[122] See further: Rajagopal D & Zilberman D *Review of Environmental, Economic and Policy Aspects of Biofuels* 2007 Policy Research Working Paper (4341) 61; and Peri M & Baldi L "Vegetable Oil Market and Biofuel Policy: An Asymmetric Cointegration Approach" 2010 (32) *Energy Economics* 687.
[123] *Report of the World Summit on Sustainable Development* Johannesburg, South Africa 26 August-4 September 2002 United Nations.
[124] Ibid at Resolution 2.
[125] *Industrial Strategy* 6.
[126] Ibid.
[127] Letete T & von Blottnitz H "Biofuel Policy in South Africa: A Critical Analysis" 2012 *Bioenergy for Sustainable Development in Africa* 193.
[128] Ibid.
[129] Amigun et al 2011 *RSER* 1360.
[130] Ibid.
[131] Jumbe et al 2009 *EP* 4981.

Therefore, there is a niche to be filled for the orchestrated governance of its production.[132]

Realising the impact of the energy sector on economic development in a developing country is the first step towards making effective change.[133] The South African government has realised the benefits of energy as a vital component in the socio-economic sector.[134] This is evident by the initiation of the biofuels movement through various and appropriate policies.[135]

2.1. Energy Policies

South Africa possesses an energy-intensive demand sector.[136] Historically, energy demand has been dominated by mining.[137] Following the establishment of the Democratic Republic of South Africa in 1994, the primary focus shifted from mining to the inclusion of industry and transport.[138] The past two decades have seen the majority of energy consumption supplied towards manufacturing and services.[139] This shift has resulted in South Africa's energy intensity being remarkably high compared to other middle-income developing countries.[140]

Energy policies began with a focus on energy supply without integrating environmental impacts, efficiency, and user equity.[141] Following the sustainable development trend, the shift in these policies to include clean energy systems is noticeable.[142]

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[132] *Industrial Strategy* 9.
[133] Mohamed & Lee 2006 *EP* 2388.
[134] Letete & von Blottnitz 2012 *BSDA* 191.
[135] Ibid.
[136] Winkler 2007 *ESD* 26.
[137] Ibid. See further Fine B & Rustomjee Z *The Political Economy of South Africa: From Minerals-Energy Complex to Industrialization* 1996 C Hurst, London.
[138] Winkler 2007 *ESD* 26.
[139] Ibid.
[140] Ibid. See further International Energy Agency 2006 *Key World Energy Statistics from the IEA* International Energy Agency, Paris.
[141] Glazewski *Environmental Law* 487.
[142] Ibid at 488.

In South Africa there has been a definitive timeline of energy policy development.[143] The chronology traces from fossil fuels, and evolves through renewable energy, following the sustainable development notion.[144] This evolution has resulted in the development of a biofuels industry in South Africa.[145]

2.1.1. General energy policies

In 1998, the Department of Minerals and Energy (DME) developed the *White Paper on Energy Policy*[146] (*Energy Paper*). The *Energy Paper* established the significance for South Africa to put energy policies into effect.[147] It not only acknowledged the importance of sourcing alternative fuels for the transport sector, but also the need for a diversified energy supply.[148] Furthermore, the *Energy Paper* provided an economic base to encourage foreign investment.[149]

2005 saw the release of the *Energy Efficiency Strategy of the Republic of South Africa*[150] (*Efficiency Strategy*). The *Efficiency Strategy* is acknowledged as the first consolidated government document aimed at directing development towards energy efficiency practices in South Africa.[151]

The National Energy Bill[152] was introduced in a similar time frame with the *Efficiency Strategy*. The Bill was dubbed at the public comment stage as the central legislation for the regulation of the energy sector.[153] Administered by the DME, the National Energy Bill provides a second legislative tier to the

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[143] *Industrial Strategy* 5.
[144] Ibid.
[145] Ibid.
[146] *White Paper on the Energy Policy of the Republic of South Africa* 1998 Department of Minerals and Energy, Republic of South Africa.
[147] *Industrial Strategy* 6.
[148] Ibid.
[149] Glazewski *Environmental Law* 488.
[150] *Energy Efficiency Strategy of the Republic of South Africa* 2005 Department of Minerals and Energy, Republic of South Africa.
[151] Ibid at (ii).
[152] National Energy Bill 2004 Department of Minerals and Energy, Republic of South Africa.
[153] Glazewski *Environmental Law* 503.

Energy Paper.[154] The Bill further entrenches the move towards alternative fuels and the diversification of energy supplies.[155]

2.1.2. Renewable energy policies

Following the DMEs lead, the then Department of Arts, Culture, Science and Technology[156] (DACST), compiled an audit to determine where the largest energy saving potential was within the government sectors. The *Technology Audit of the Transport Fuels Sector in South Africa*[157] (*Technology Audit*) revealed improving vehicle efficiency would yield optimum energy usage reduction.[158] Furthermore, it confirmed alternative fuels, such as biofuels, needed to be investigated as a means of energy reduction.[159] This directed a new approach by the government to intervene in the transport sector.[160]

The novel approach was in the form of the National Energy Bill which gave effect to the *White Paper on Renewable Energy*[161] (*Renewable Paper*).[162] The DME released the *Renewable Paper* in response to the *Technology Audit*,[163] through providing a supporting framework for existing energy statutes.[164]

Being the first policy in South Africa to focus solely on renewable energy, the *Renewable Paper* was also the first policy to acknowledge renewable energy as a viable alternative resource.[165] The transport sector had, at this point, become the sector that mostly needed to reduce energy

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[154] Ibid.
[155] *Industrial Strategy* 6.
[156] DACST was split into separate departments in 2002: Department of Arts and Culture, and the Department of Science and Technology (DST).
[157] *Technology Audit of the Transport Fuels Sector* 2001 Department of Arts, Culture, Science and Technology, Republic of South Africa.
[158] *Industrial Strategy* 6.
[159] Ibid.
[160] Paterson A & Kotzé L *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* 2009 Juta and Company Ltd, Cape Town 324.
[161] *Renewable Paper.*
[162] *Industrial Strategy* 6.
[163] Ibid.
[164] Glazewski *Environmental Law* 503.
[165] *Legal Frameworks* 102.

consumption.[166] In South Africa, transport fuels utilise 30 per cent of national energy resource content, however the value is measured at a much higher 70 per cent,[167] as the true value of a finite resource is much higher than that of its numerical percentage value.[168]

The objective of the *Renewable Paper* was to optimise renewable energy use to integrate it into the mainstream energy economy.[169] It defined renewable energy targets to be achieved by 2013.[170] These non-mandatory targets were later enhanced with the *Draft Integrated Energy Planning Report*[171] (*Integrated Plan*) in 2013, which included a more substantial and broader policy approach.[172] The *Integrated Plan* outlined a strategy for the overall management of the country's energy supply.[173] By cross-referencing supply with demand, an overview was constructed of where renewable energy methods should aim for.[174]

In the interim of the *Renewable Paper* and the *Integrated Plan*, the South African government had taken steps to enact numerous energy regulations and acts.[175] The *Efficiency Strategy* formed one of these steps.[176]

The *Integrated Plan* proceeded to release arguably the most important policy to contribute to the support for renewable energy, the *Integrated Resource Plan for Electricity 2010-2030*[177] (IRP).[178] The IRP defines the

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[166] *Industrial Strategy* 17.
[167] Ibid at 6.
[168] Ibid.
[169] Glazewski *Environmental Law* 488.
[170] *Legal Frameworks* 102.
[171] *Draft 2012 Integrated Energy Planning Report: Executive Summary (for Public Consultation)* 2013 Department of Energy, Republic of South Africa.
[172] *Legal Frameworks* 102.
[173] Ibid.
[174] Ibid.
[175] Ibid. The Electricity Regulation Act (No. 4 of 2006) GG No. 28992 Republic of South Africa, was enforced in 2006; thereafter the National Energy Act in 2008. These two Acts will be addressed in Chapter 3 at 33.
[176] *Efficiency Strategy* (ii).
[177] *Integrated Resource Plan for Electricity 2010-2030: Final Report* 2011 Department of Energy, Republic of South Africa.
[178] *Legal Frameworks* 102.

country's goal to expand on means of power supply, diversifying the mix to better include RETs, over the next two decades.[179]

With a lack of concrete policies in place, the IRP is on a slow-moving ride.[180] The power sector has followed historical practice and continued with coal power plants.[181] This can be attributed to the lack of effective renewable resource support instruments.[182]

The appropriate supporting tool for the IRP is the National Energy Regulator of South Africa[183] (NERSA), which is a regulatory body established by the National Energy Regulator Act[184] (NERA), and defined by the Petroleum Products Act[185] (PPA). NERSA's mandate is to regulate petroleum and other pipeline industries,[186] in terms of the appropriate acts.[187] The primary goal for NERSA is to become a world-class leader in energy regulation, which would include biofuel production.[188]

Many of the energy policies mentioned above transfer directly to the development and implementation of petroleum policies and their relative products. NERSA for example, was established in terms of NERA,[189] and thereafter created the Petroleum Pipelines Regulations[190] (Pipelines Regulations). The Pipelines Regulations are a set of guidelines which provide

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[179] Ibid.
[180] Ibid.
[181] Ibid at 103.
[182] Ibid at 102.
[183] Petroleum Pipelines Regulations (Version 1 of 2003) National Energy Regulator of South Africa.
[184] National Energy Regulator Act (No. 40 of 2004) GG No. 27458 Republic of South Africa.
[185] Petroleum Products Act (No. 120 of 1977) GG No. 35581 Republic of South Africa.
[186] The regulatory act for pipelines is the Petroleum Pipelines Act (No. 60 of 2003) GG No. 26434 Republic of South Africa.
[187] NERSA also regulates electricity and piped-gas: Electricity Regulation Act and the Gas Act (No. 48 of 2001) GG No. 23150 Republic of South Africa. National Energy Regulator of South Africa "Legislation Overview" 2009 Available at: http://www.nersa.org.za/# [accessed 28.07.15].
[188] Ibid.
[189] Pipelines Regulations.
[190] Ibid.

information to assist licence applicants in the construction, operation, and conversion of petroleum pipelines, storage, and loading facilities.[191]

NERSA is an important regulatory authority which aims to regulate the energy industry in accordance with the plethora of government policies and laws.[192] It incorporates international standards and best practices into its guidelines in support of sustainable development.[193]

NERSA's goals are strategically outcome-orientated, reflecting key policy priorities.[194] Through its facilitation, NERSA assists in the overall objective for the energy agenda of improving national socio-economic and political development.[195]

After highlighting the theoretical strengths of NERSA, it must be reiterated that presently NERSA is not being effectively implemented in its role as a regulatory tool.

Another regulatory policy avenue is through a future programme, the Renewable Energy Independent Power Producer Procurement Programme[196] (REIPPPP). REIPPPP covers a wide range of criteria in project selection, including cost effectiveness and the overall water demand of the project.[197] It supplies an additional layer of environmental awareness into renewable energy options, at the same time adhering to the biofuel production goal of sustainable development.[198]

2.1.3. Biofuel policies

The introduction of biofuels, novel production techniques, and new technologies into South Africa has been coordinated through two draft policies. The *Industrial Strategy* formed the foundation for the innovation and

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[191] Ibid at s(A).
[192] "Legislation Overview".
[193] Ibid.
[194] Ibid.
[195] Ibid.
[196] *Position Paper* 19.
[197] Ibid at 24.
[198] *Industrial Strategy* 5.

promoted further research and investigation into biofuel implementation in South Africa.[199] The *Position Paper* was then released following the conclusion of the *Industrial Strategy*'s prescribed timeline and objectives.[200]

In 2005 Cabinet directed the then DME to address the biofuels concept and to coordinate a scheme that would regulate its production.[201] Thus, the *Industrial Strategy* was developed at an inter-departmental level along with an implementation body, the Biofuels Task Team (BTT).[202]

Approved in 2007, the *Industrial Strategy* focused on short-term objectives.[203] It aimed to penetrate national liquid fuels with a 2 per cent level of biofuels over a five-year pilot phase, from 2008 to 2013.[204]

A specific requirement for the *Industrial Strategy* was to create a link between the economies, connecting the first and second levels to create a balance.[205] Through this the *Industrial Strategy* hoped to stimulate rural development to reduce poverty.[206] This alleviation would be done by creating sustainable income opportunities through the generation of sustainable fuel alternatives.[207]

Through the *Industrial Strategy*, the potential to meet global renewable energy goals and domestic objectives is attainable.[208] In addition, securing energy security and upholding the commitment to reducing greenhouse gas emissions are made tangible with its implementation.[209] A feasibility study

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[199] *Industrial Strategy* 9.
[200] Ibid.
[201] Ibid. The then Department of Minerals and Energy (DME), now the Department of Energy (DoE).
[202] Ibid; Department of Minerals and Energy "Update on the Biofuels Industrial Strategy" 30 January 2013 Presented by Modise M, Chief Director of Clean Energy. Available at: http://www.innovationeasterncape.co.za/download/presentation18.pdf [accessed 14.10.14].
[203] *Industrial Strategy* 3.
[204] Ibid. See further: *Position Paper* 9; Brent A, Wise R & Fortuin H "The Viability of the South African Biofuels Industrial Strategy" 2009 (39) *International Journal of Environment and Pollution* 74; and "Update".
[205] *Industrial Strategy* 5.
[206] Ibid at 9.
[207] Ibid.
[208] *Industrial Strategy* 8.
[209] Ibid.

underpinning the *Industrial Strategy* was conducted that considered many of these factors.[210] The study revealed a number of problematic governmental sectors that the biofuels industry could support, from job creation to Black Economic Empowerment.[211] These results helped to highlight the priority areas for further development of the *Industrial Strategy*, and the enabling regulations that would follow it.[212]

Despite the efforts of the BTT there still remained a niche for an effective biofuels implementation strategy in South Africa.[213] Biofuel projects are seen as financially unattractive and thus the industry remains stagnant without one prominent player.[214]

The *Position Paper* has been designed by the DoE to fill this niche.[215] It focuses on the implementation, monitoring, and refinement of the DME's *Industrial Strategy*.[216]

The DoE undertook numerous studies to effectively produce the elements described under the *Position Paper*.[217] Since financial implications of biofuel investments are specifically attached to the prevailing oil and feedstock prices, the DoE focused the studies on the refinement of the *Industrial Strategy* with the *Position Paper.*[218]

The drivers for the implementation of the *Position Paper* can be summarised with three main points: mandatory blending of petrol and diesel with biofuels; licensing of manufacturers; and the development of a pricing framework.[219]

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[210] Ibid.
[211] Ibid at 9.
[212] Ibid.
[213] "Update".
[214] *Position Paper* 9.
[215] Ibid.
[216] Ibid.
[217] These studies are discussed in Chapter 3, refer 3.2.2. at 41, and 3.2.5. at 59.
[218] *Position Paper* 9.
[219] Ibid at 10.

This focus has shifted from the *Industrial Strategy*, which had the underlying aim of advancing emerging farmers.[220] The DoE collaboration with the BTT also sought to support projects for the establishment of legal and regulatory environments under the *Position Paper*.[221] This came immediately after the government deemed biofuels a potential major source of employment.

Case studies identified in the *Position Paper* were designed specifically to target the commercialisation of biofuel production.[222] Through consultation efforts with the BTT, the DoE has adopted one of these cases as a Government-owned biofuels project.[223] This adoption creates a regulatory environment that will result in a more conducive setting for biofuel production.[224]

2.1.4. Climate change policies

Environmental concerns pose significant challenges to how energy is used and supplied.[225] The question arises if any energy policies exist in South Africa that will help contribute to the country's energy development. Policies ultimately contribute to development that is socially, economically, and environmentally more sustainable.[226] Another angle to address this question is whether energy policies designed for sustainable development can be structured to include a climate change mitigation approach.

Energy policies that aim to meet objectives for local sustainable development are a promising approach to adopt.[227] This is especially

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[220] Fuels and Alternatives "The Biofuels Strategy" 2008 Published in TWA 03/04 Comments by Dave Wright, General Manager of Engen Corporate Planning.
[221] *Position Paper* 10.
[222] Ibid. Biofuels may also play a mediating role in the agriculture decline in South Africa.
[223] Ibid. Specifically the "Arengo Project", a bioethanol production plant located in the Eastern Cape.
[224] Ibid.
[225] Winkler 2007 *ESD* 26.
[226] Ibid.
[227] Ibid at 34.

important in order to make a valid contribution towards climate change mitigation.[228]

To efficiently address the role of climate change policies in the establishment of biofuel production in South Africa, an international convention provides reference. The UNFCCC focuses on global climate change concerns.[229] Conventions of this magnitude yield international agreements that eventually form part of customary law.

The Kyoto Protocol,[230] an extension to the UNFCCC, commits each signatory state to strive towards achieving a reduction in energy and carbon emissions in order to promote sustainable development.[231]

South Africa became signatory to the Kyoto Protocol in 2002.[232] Although the treaty does not require late signatory countries[233] to commit to major emission reduction targets, it creates potential for future emission reduction objectives.[234] The Kyoto Protocol further established the Clean Development Mechanism[235] (CDM), which allows for trade-certified emission reductions between countries that signed at the adoption of the UNFCCC or as late signatories.[236]

This addition through the CDM supports the goal of working towards sustainable development in developing countries.[237] The CDM is to be the primary international offset programme that has yet to be fully established.[238] Although the regulatory aspects are by no means perfect, the CDM has

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[228] Ibid.
[229] UNFCCC Art(2).
[230] Kyoto Protocol to the United Nations Framework Convention on Climate Change 1998 United Nations.
[231] Ibid at Art(2).
[232] *Industrial Strategy* 6.
[233] The Kyoto Protocol refers to such countries as 'Annex 1 countries'. Annex 1 countries are those that acceded to the Kyoto Protocol at the conclusion of the 1992 UNFCCC.
[234] *Industrial Strategy* 6.
[235] *The Clean Development Mechanism: Climate Change Guide to the Kyoto Protocol* 2002 United Nations.
[236] *Industrial Strategy* 6.
[237] Ibid at 7.
[238] Gillenwater M & Seres S *The Clean Development Mechanism – A Review of the First International Offset Program* 2011 Pew Centre on Global Climate Change 1.

significantly fast-tracked the global market for greenhouse gas emission reductions.[239]

There have been notable interests expressed from international funders to aid South Africa in launching renewable energy research centres and programmes.[240] Specifically focusing on energy and climate change, the German Gesellschaft für Internationale Zusammenarbeit (GIZ), which translates to the 'Society for International Collaboration', recently launched a joint agenda with South Africa.[241] GIZ has also helped with the establishment of research and development for wind energy in the Western Cape.[242] The South African-German Energy Programme supports the DoE initiatives to establish policy formulation and implementation.[243] It also provides advice on integrating renewable energy systems into the grid.[244]

Policies within the energy sector are comprehensive in structure and form a solid base from which energy law builds upon.[245] The future legal framework for the regulation of biofuel production subsequently has adequate grounding policy with reference to energy and climate change policies.

2.2. Environmental Policies

Environmental law is similar to energy law.[246] It is suggested that they are a collection of different branches of the same law specific to conservation and energy production.[247]

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[239] Ibid; *Industrial Strategy* 7. The CDM goes further to allow for alternative fuel projects to apply for carbon emission reduction credits via inadvertently promoting biofuels and mandatory blending through the condition of 'fuel switching', to receive carbon emission reduction credits.
[240] *Legal Frameworks* 103.
[241] Ibid.
[242] Ibid.
[243] Ibid.
[244] Ibid.
[245] *Integrated Plan* 5.
[246] Glazewski *Environmental Law* 487.
[247] Ibid.

Environmental assessment has been practiced in South Africa since the 1970s.[248] The *Green Paper on an Environmental Policy for South Africa* has since been integrated into policy frameworks to further instil environmental protection.[249]

Environmental policy has an important role in helping South Africa meet its developmental needs.[250] A consultative process was initiated in order to develop it.[251] This process was aimed at generating a working Green Paper that would focus on South Africa's environmental concerns and policy opinions.[252]

A study orchestrated by the DST for the *Industrial Strategy*, and by the Biodiesel Joint Implementation Committee for biodiesel government support,[253] further entrenched the notion of environmental protection. In 2006, the Cleaner Fuels Programme was put into effect to begin phasing out lead-based petrol.[254] The programme serves to outline the direction of the South African Government in improving fuel quality,[255] while also aiming to reduce the amount of sulphur in diesel.[256] The Cleaner Fuels Programme is a joint venture between refineries and various petroleum depots.[257] Its objective is to improve the quality of transportation fuels to better meet legislative requirements ordered for the cleaner-burning of fuels.[258] Such

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[248] Ibid at 235.
[249] *Green Paper on an Environmental Policy for South Africa* 1996 Department of Environmental Affairs and Tourism, Republic of South Africa.
[250] Ibid.
[251] Ibid at Preface. This process is known as the Consultative National Environmental Policy Process.
[252] Ibid.
[253] *Industrial Strategy* 7.
[254] Ibid.
[255] Mabele Fuels "Clean Fuels 2" 2015 Available at: http://www.mabelefuels.com/policies-responsibilities/clean-fuels-2/ [accessed 05.07.15].
[256] *Industrial Strategy* 7.
[257] Nichols L "South Africa – Africa's Clean Fuels Leader?" January 2014 Hydrocarbon Processing, Gulf Publishing. Available at: http://www.hydrocarbonprocessing.com/Article/3356440/South-AfricaAfricas-clean-fuels-leader.html [accessed 05.07.15].
[258] Ibid.

initiatives have the ability to push South Africa to the forefront of clean fuels production across the continent.[259]

Environmental protection is more evident in legislation than it is in policy.[260] The notion has not been defined by a singular policy development. As already mentioned, the WSSD extended to the JPoI, which commits to the development of new RETs.[261] However, no national forum extends to the involvements of institutions in biodiversity and conservation.[262]

Following South Africa's ratification of the Convention on Biological Diversity (CBD) in 1995,[263] the need for a coherent and integrated policy on conservation was established.[264] The central policy for South Africa is the *White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity*[265] (*Biodiversity Paper*).[266] This comprehensive policy was a markedly novel approach by Cabinet, as previously no direction had been taken towards biodiversity.[267] The themes of the *Biodiversity Paper* follow the objectives of the CBD.[268]

There have been many international agreements on conservation that South Africa has signed to.[269] One of the most significant policies is the New Partnership for Africa's Development.[270] It has a strong emphasis on conservation and integrates biodiversity as an economic strategy.[271]

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[259] Ibid.
[260] Wynberg R "A Decade of Biodiversity Conservation and Use in South Africa: Tracking Progress from the Rio Earth Summit to the Johannesburg World Summit on Sustainable Development" 2002 *South African Journal of Science* 235.
[261] Refer Chapter 2 at 15.
[262] Wynberg 2002 *SAJS* 235.
[263] Convention on Biological Diversity 1992 United Nations ILM 818.
[264] Wynberg 2002 *SAJS* 234.
[265] *White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity* 1997 General Notice 1095 Department of Environmental Affairs and Tourism, Republic of South Africa.
[266] Wynberg 2002 *SAJS* 234.
[267] Ibid.
[268] Ibid.
[269] Ibid.
[270] *Communiqué*; Wynberg 2002 *SAJS* 234.
[271] Wynberg 2002 *SAJS* 234.

Although international policies for environmental protection are comprehensive, the domestic policy sector is lacking. There are numerous challenges for the legal and administrative management of environmental protection in South Africa.[272] There exist many gaps in the policy context for its integration into law.[273] These gaps are also identified within the fiscal sector which could in turn be contributing to the challenges within environmental policy.[274]

2.3. Fiscal Policies

There is a vast range of policies in the fiscal sector, most with single-tracked objectives. However, support for different governmental sectors is evident in its governance.

A prime example was orchestrated by the National Treasury in approving an increase of the Fuel Levy Exemption in 2005.[275] This exemption was designed specifically for biodiesel.[276]

Fuel levies in South Africa form part of the general fuel tax, measured in cents per litre (cpl).[277] The fuel levy is set annually by the National Treasury and is requested to review and increase the amounts at each new financial year.[278] The increase depends on the volumes of petrol and diesel sold per annum, weighing it against the imposed levy.[279] Fuel levies are administered by the South African Revenue Services (SARS), according to

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[272] Ibid at 235.
[273] Ibid.
[274] Fiscal policy will be unpacked in the next sub-heading.
[275] *Industrial Strategy* 7. The National Treasury is the organisation responsible for managing South Africa's national government finances.
[276] Ibid. The exemption was originally introduced in 2003. This increase resulted in exemptions up to 40 per cent.
[277] A fuel levy is a flat rate tax on fuel. Governments impose fuel levies to reduce the regular tax burden on locals. See further Road Accident Fund "Fuel Levy" March 2015 Available at: http://www.raf.co.za/about-us/pages/fuel-levy.aspx [accessed 28.07.15].
[278] Ibid.
[279] Ibid. The levies contribute to the Excise Duty, Fuel Levy, and Road Accident Fund Levy if the products are consumed within South Africa.

the provisions of the Customs and Excise Act (CEA).[280] Biofuel investors qualify for both a tax-depreciation and levy exemptions.[281]

Most notable of the fiscal regulatory tools are those introduced through market-based instruments.[282] The same year as the introduction of the fuel levy exemption, the newly separated DST formulated a Biodiesel Joint Implementation Committee.[283] This committee conducted a study in 2005, which concluded government support for biodiesel initiatives as justified due to socio-economic and environmental benefits.[284]

Shortly after the fuel levy exemption, together with the DME, the National Treasury approved a *Renewable Energy Capital Subsidy Scheme* (*Subsidy Scheme*) in 2006.[285] The *Subsidy Scheme* bequests once-off capital grants allocated to new renewable energy projects.[286] Such operations provide incentive to industries and developers to invest in alternative fuel initiatives.[287] The *Subsidy Scheme* provided for a total of R20million to be injected into bioethanol and biodiesel.[288] However, cost competitive world-scale projects generally require investments figures upwards of R1billion.[289] This proposed support amounted to approximately 2 per cent of the investments required to effectively establish biofuel production plants in South Africa.[290]

In the same timeframe as the *Subsidy Scheme*, the South African Bureau of Standards (the Bureau) was granted approval by the DST, to develop relevant analytical techniques to perform biofuel analysis tests.[291] With the introduction of the *Industrial Strategy* and its accompanying

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[280] Customs and Excise Act (No. 91 of 1964) Republic of South Africa.
[281] *Industrial Strategy* 7.
[282] *National Climate Change Response White Paper* 2011 Republic of South Africa 40.
[283] *Industrial Strategy* 7.
[284] Ibid.
[285] Ibid.
[286] Paterson & Kotzé *Environmental Compliance* 317.
[287] Ibid.
[288] *Industrial Strategy* 7.
[289] Ibid.
[290] Ibid.
[291] *Industrial Strategy* 7.

feasibility study,[292] the extent of government support for the biofuel movement became clear.[293]

Briefly overlapping different sectors, the IRP highlighted the aim for South Africa to build new power capacity via renewable alternatives over the next two decades.[294] It also defined long-term generation goals through analysing various policy options.[295]

South Africa introduced a feed-in tariff in 2009 that was abolished later that same year due to lack of success, and replaced with a bidding programme.[296] Overall it is evident that the hesitancy of investors resulted in minimal renewable resource capacity development.[297]

Despite the abrupt shifts in policy, the bidding program was established for public competition in 2011.[298] It became especially popular amongst project developers,[299] with more than 270 investors bidding for opportunity.[300] However, there still exists a gap in fiscal policy, especially concerning financial support for investors.[301]

Budget reports are released annually by the minister, outlining market-based instruments used to support policy objectives.[302] The *Budget Review,* is released by the National Treasury and contributes to the implementation of key changes to fiscal policies, to shape the economy towards a more solid foundation for future growth.[303]

The *National Treasury Strategic Plan* (NTSP) was released this year outlining the budget plan until 2019.[304] One of the key areas of the plan

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[292] Refer 2.1.3. at 22.
[293] *Industrial Strategy* 9.
[294] *Legal Frameworks* 102. The IRP was released by the DoE in 2011, refer 2.1.2. at 19.
[295] Ibid.
[296] Ibid.
[297] Ibid.
[298] Ibid.
[299] Ibid.
[300] Ibid at 104.
[301] Ibid at 102.
[302] *Budget Review* 25 February 2015 National Treasury, Republic of South Africa.
[303] Ibid at 1.
[304] *National Treasury Strategic Plan* 2015-2019 National Treasury, Republic of South Africa.

focuses on the promotion of policy coherence of those with job growth objectives.[305] This illustrates the importance of promoting projects and initiatives that incorporate similar objectives. The biofuels venture has repeatedly been viewed as a poverty alleviating enterprise.[306] It therefore falls under the scope of the NTSP.[307]

Fiscal policy support is incremental for the future of biofuel regulation.[308] Market-based instruments have the potential to shape the framework for sustainable development.[309] By imposing environmental taxes and charges, environmental fiscal reform contributes to revenue requirements of sustainable development objectives.[310]

With the numerous renewable energy strategies being developed, there is a decided niche for subsidies, a comprehensive structure for investment tax and subsequent reduction, and other forms of fiscal incentives.[311]

Overall, the *Budget Review* incorporates energy concerns, biofuel initiatives, and also environmental constraints into the annual report.[312] Through fiscal policy instruments it is evident of the support for various other sectors.

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[305] Ibid at 8.
[306] *Industrial Strategy* 8.
[307] NTSP 8.
[308] *Draft Policy Paper: A Framework for Considering Market-based Instruments to Support Environmental Fiscal Reform in South Africa* 2006 Tax Policy Chief Directorate, National Treasury, Republic of South Africa.
[309] Ibid.
[310] Ibid.
[311] *Legal Frameworks* 102.
[312] *Budget Review.*

Chapter 3: Legal Framework

3.1. Key Elements to be regulated by Law

Policies ultimately give effect to established legislation. Through a process of transformation, mandated policy reforms are structured to provide the framework from which laws extend to form the appropriate legislative arch.[313]

One of the more notable energy policies that led to the enforcement of the National Energy Act[314] was the *Efficiency Strategy*. Furthermore, the mandate of the energy regulatory body, NERSA, is anchored in both the Pipelines Act and NERA.[315]

Policies are important in the evolution of law as critical stepping stones towards effective governance. It is important to incorporate extensions of relevant laws within frameworks and regulations.

The success of biofuels varies greatly between countries.[316] Triumph can only come as a result of government support.[317] Long-term investments and technical proficiency have proven themselves to be worthy factors.[318] The most influential factor to be documented in biofuel success is the fluctuating global oil price.[319] A strategy based on developing a connection between the various sectors is needed, particularly with the fuel market, oil price, and renewable energy.[320]

With the various sector policies that identify or highlight support for biofuels outlined in Chapter 2, crucial elements can now be discussed that are to be integrated into the future legal regulatory framework. The prevailing issues that present themselves in the policy context have been identified as:

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[313] NTSP 8.
[314] National Energy Act.
[315] Refer 2.1.2. at 20.
[316] *Industrial Strategy* 11.
[317] Ibid.
[318] Ibid.
[319] Ibid at 12.
[320] Ibid.

identifying different types of fuels and their products; regulation of mandatory blending; issuing of licensing and permits; identifying reference crops and locations; pricing schemes; criteria for incentives and eligibility of government support; and governance of institutions. These elements will be addressed by highlighting the main concerns for each and identifying the legislative avenues through which they can be regulated.

3.2. Review of South Africa's Relevant Legal Framework

The *Industrial Strategy* led to the development of the *Position Paper*.[321] To successfully critique the proposed biofuels framework for South Africa, both policies need to be reviewed together.

Following a brief address of the need for a biofuel industry, the *Position Paper* launches directly into the implementation of the *Industrial Strategy*.[322] The critical stages of implementation are outlined as: mandatory blending of biofuels with petrol and diesel; licensing processes for manufacturers in terms of the PPA; development of a pricing framework; and the encouragement of government agencies to endorse supporting projects for the duration of the *Industrial Strategy*'s development.[323] These implementation stages can be identified within the key elements for a successful legal biofuels regime.

The *Position Paper* addresses the adoption by the BTT of a government-owned biofuels project.[324] As the pioneer biofuels project in South Africa,[325] tit would be used as a case study to identify key elements to address in the proposed scheme.[326] No further elaboration on this project is

[321] *Position Paper* 9.
[322] Ibid.
[323] Ibid.
[324] Ibid at 10. Refer 2.1.3. at 24.
[325] Nasterlack et al 2014 *ESD* 13.
[326] Ibid.

taken up in the *Position Paper*, nor does it address the purpose of implementing a biofuels strategy.[327]

These shortfalls and others will be critiqued against the policy context unpacked in Chapter 2, while delineating the correct channels of legislation the future framework should take. As mentioned, the following sections will review the main identified elements that contribute to an effective biofuels regulatory framework, discussing issues relevant to each and how the future framework either provides for or fails to accommodate for these issues. The *Industrial Strategy* and the *Position Paper* will be cross-referenced in order to reflect the proposed regime for biofuel regulation in South Africa, in relation to the existing legislation that would give effect to it.

To further evaluate South Africa's proficiency in entering the international pool for effective regulatory mechanisms, existing policies need to be addressed. Key features of the proposed legal framework in the *Industrial Strategy* and the *Position Paper* need to be critically reviewed to determine if they give effect to the crucial elements identified in Chapter 2.

3.2.1. Types of fuels and products

The target biofuel forms for both the *Industrial Strategy* and the *Position Paper* are bioethanol and biodiesel.[328] These are the two most-common, first generation biofuels being developed globally.[329]

Currently, only biodiesel is being considered for production in South Africa, with a specific focus on the transport sector.[330] Biodiesel is the chief candidate for internal engines as a petroleum replacement.[331] However,

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[327] *Position Paper* 10.
[328] Ibid at 18; *Industrial Strategy* 3. Thus far in South Africa only bioethanol and biodiesel have been included in infrastructure development plans.
[329] Letete "Modelling" 9.
[330] Letete & von Blottnitz 2012 *BSDA* 194.
[331] Charles et al 2007 *EP* 5738.

bioethanol has now been noted as the ideal biofuel to be produced from the lands in the Southern hemisphere.[332]

Bioethanol and biodiesel have also been the most productive liquid biofuels to date.[333] In the 1920's South Africa was documented to have utilised sugar cane bioethanol products in petrol.[334] The practice was discontinued when international crude oil prices began to drop.[335] Currently, numerous sugar industries have invested in bioethanol production for export to alcohol markets, and developing a fuel capacity for export.[336] Biodiesel demand has also peaked globally due to current high oil prices.[337] The collaboration of various maize growers and private investors for the construction of maize-to-ethanol facilities has dwindled considerably.[338] This faltering is attributed to ill-regulated incentives and uncertain policies.[339]

As previously mentioned, biodiesel can be implemented in three ways: as a blend, in its crude form, or as an additive.[340] The utilising of biodiesel in its crude form would trigger the licence conditions of the Pipelines Act.[341] Specifically the clause referring to conditions for crude oil or petroleum, where it specifies pipelines need to have sufficient capacity to contain neat substances.[342] In its crude form biofuels, and specifically biodiesel, may accelerate pipeline degradation.[343] This may result in the crude biodiesel form not being able to be accessed in terms of the Pipelines Act.[344] Biodiesel

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[332] The South is defined as the countries in the Southern Hemisphere in the on-going struggle between the North-South. It is assumed that North countries are developed with advanced technologies, as opposed to the developing nations of the South with technological limitations. See further Mathews J "Viewpoint: Biofuels – What a Biopact between North and South Could Achieve? 2007 (35) *Energy Policy* 3554.
[333] *Industrial Strategy* 3.
[334] Ibid at 10.
[335] Ibid.
[336] Ibid.
[337] Ibid.
[338] Ibid.
[339] Ibid.
[340] Refer 1.1. at 7.
[341] Pipelines Act ch3(20)(f).
[342] Ibid at ch3(20)(1)(f).
[343] Nolte "Biodiesel" 16.
[344] Ibid; Pipelines Act ch3(20)(1)(f).

would then only be able to be integrated into regulatory biofuel legislation as a blend.

The Pipelines Act extends to the Pipelines Regulations to assist in licensing for petroleum pipelines and storage facilities.[345] This creates an additional layer of governance for petroleum pipelines. It also creates more difficulty for crude biofuel forms. Blends are revealing themselves to be the dominant biofuel form for implementation and regulation.[346]

From the translation of policies into law, the *vice versa* role is becoming apparent. Through policies informing the development of competent legislation, the subsequent acts are further creating regulations that assist in the enforcement of the laws themselves.[347] This is evident by the enactments of NERA, the Pipelines Act, and the National Energy Act, which further established NERSA.[348] NERSA then developed the Pipelines Regulations to assist with the enforcement of the acts, and the overarching PPA.[349] Through these mechanisms, the regulation of the specific biofuel forms can be correctly enforced, with NERA as the underpinning legislation and NERSA acting as the regulatory body.

Within any biofuel policy the biofuel types and products needs to further identify the source of each feedstock for fuel production.[350] The *Position Paper* dissects the selection of reference crops with significant

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[345] Pipelines Regulations s(A). Licensing will be addressed later in this chapter, refer 3.2.3. at 45.
[346] Mandatory blending of biofuels is discussed under the next sub-heading, refer 3.2.2. at 40.
[347] See further Dolowitz D & Marsh D "Learning from Abroad: The Role of Policy Transfer in Contemporary Policy-making" 2000 (13) *Governance: An International Journal of Policy and Administration* 5-24.
[348] Pipelines Regulations s(A).
[349] Ibid. This note will be discussed throughout this chapter.
[350] Carriquiry M, Du X & Timilsina G "Second Generation Biofuels: Economics and Policies" 2011 (39) *Energy Policy* 4223. Feedstocks are discussed later in this chapter, refer 3.2.4. at 49.

detail,[351] which results in the selection of fuels to be produced. Yet, there currently exists no approved set of standards to comply with.[352]

The Standards Act[353] authorises the Bureau.[354] As the competent authority, the Bureau regulates the South African National Standards (SANS).[355] SANS is a set of National Norms for standards to adhere to.[356] The National Norm referred to should detail the development and amendment of SANS to allow for harmonisation with international requirements.[357] The Bureau is further regulated by the Public Finance Management Act[358] (PFMA), to ensure that standards are meeting the objectives as laid out in the Standards Act.[359]

The Standards Act exists to promote development and maintenance of quality regulation in South Africa.[360] Yet there is no prescribed standard for new technology of producing renewable and alternative fuels.[361] This process appears to be moving forward with no regulatory tool in place.[362]

The Standards Act is identified as the “peak national standardisation institution in South Africa”.[363] Thus, this would be the referring legislation for product blending standards. Together with PFMA, the Standards Act has the enforcing power to regulate standards of biofuels and its products at a national level.[364]

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[351] See further *Position Paper* 18-25.
[352] Ibid at 25.
[353] Standards Act (No. 8 of 2008) GG No. 31253 Republic of South Africa.
[354] Ibid at s2.
[355] Ibid at s2(4)(1)(a).
[356] Ibid at s3(23).
[357] Ibid at s3(23)(2)(a)(iii).
[358] Public Finance Management Act (No. 1 of 1999) GG No. 19814 Republic of South Africa.
[359] Standards Act s2(3)(4).
[360] Ibid at Preamble.
[361] *Position Paper* 25.
[362] Ibid.
[363] Standards Act Preamble.
[364] Ibid at s2(3)(4).

Extended from the PPA are the Regulations Regarding Specifications and Standards[365] (Standards Regulations). The Standards Regulations lay out a comprehensive list for biodiesel blends, but significantly lack in guidance for bioethanol and petrol blends.[366] Although biodiesel has been the most popular alternative up to now, bioethanol is on the rise.[367] Bioethanol now requires a list of blends, or at the very least, regulatory measures for the blending percentages of bioethanol.

Later in this chapter, the relative blend percentages of bioethanol and biodiesel are addressed.[368] It is important to note the effectiveness of bioethanol against regular petrofuel as it is currently more widely utilised.[369] Bioethanol is also being used in higher percentages in blends.[370] When comparing bioethanol with unleaded petrol or gasoline, the biofuel blend appears superior, even in its raw form.[371] This further entrenches the need for effective regulatory standards.[372]

As has been identified, the major lacking components for regulation of chosen biofuel types are adequate guidelines. Such guidelines would define selection criteria and relative production components. Through the PPA and the subsequent Standards Regulations this could be regulated, as they already contain prescription information for biodiesel blends.[373]

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[365] Regulations Regarding Petroleum Products Specifications and Standards 2006 Government Notice R. 627 GG No. 28958 Department of Minerals and Energy, Republic of South Africa.
[366] Ibid at s5(1)(a)(ii).
[367] Ajanovic 2011 *Energy* 2072.
[368] Refer 3.2.2. at 41.
[369] Mathews 2007 *EP* 3554.
[370] Ibid.
[371] Alvarez 2009 *LR* 134.
[372] Ibid. A brief explanation of this: complete burning of the fuel during operation due to the higher percentage of oxygen present, resulting in a reduced amount of hydrocarbon emissions.
[373] Standards Regulations s5(1)(a)(ii).

3.2.2. Mandatory blending

The term 'mandatory blending' refers to the process of issuing an obligation on all petrofuel manufacturers.[374] This duty orders producers to blend a prescribed percentage of their produced fuel with certain approved biofuels.[375]

The PPA is the overarching legislation for all petroleum processes and regulations.[376] It has been amended on numerous occasions. In 2006, an amendment[377] was concluded in support of the Cleaner Fuels Programme.[378] It issued a specific percentage allowance to biodiesel, and mandated general fuel specifications according to SANS.[379] The Bureau approved SANS in terms of the Standards Act.[380] These standards have been reflected in further legislation since the PPA Amendment in 2006.

SANS is responsible for finalising specifications for biodiesel and bioethanol.[381] The standards are aligned with those ordered in the EU and the United States of America (US).[382] The similarities with both the EU and the US are to enhance the development of cleaner fuel integration into the South African petroleum products pool.[383]

The Standards Act brought about the development of a system that would regulate the mandatory blending of prescribed biofuels with regular petrofuels, to allow a retail standard in South Africa.[384] The PPA Schedule, Regulations Regarding the Mandatory Blending of Biofuels with Petrol and

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[374] *Industrial Strategy* 19.
[375] Ibid.
[376] PPA Preamble.
[377] Petroleum Products Regulation (No. 38 of 2006) GG No. 28408 Republic of South Africa.
[378] *Industrial Strategy* 7.
[379] Ibid at 8.
[380] Standards Act s2(3)(1). The Bureau means the South African Bureau of Standards, refer 2.3. at 30.
[381] *Industrial Strategy* 8.
[382] Ibid.
[383] Ibid.
[384] Regulations Regarding the Mandatory Blending of Biofuels with Petrol and Diesel 2012 Government Notice R. 671 GG No. 35623 Republic of South Africa.

Diesel[385] (Blending Regulations), which is yet to commence, has been developed to regulate blend mandates.[386] The regulation is according to SANS.[387] It orders all manufacturers to obtain quality assurance certificates on supply or delivery to a blending facility.[388]

The Blending Regulations issue minimum concentrations for biodiesel and bioethanol in the final biofuel blend,[389] 5 per cent for biodiesel, and between 2 and 10 per cent for bioethanol.[390] The blend minimum is further entrenched within the Standards Regulations,[391] which lists all diesel grades with their relative maximum blends.[392]

The DoE undertook a study to determine the value added to the product of blending bioethanol with regular petrofuel.[393] A deadline for the implementation of mandatory blending was identified as October 2015.[394] It elaborates on date configuration and attributes it mostly to delays in the finalising of the Biofuels Pricing Framework (Pricing Framework).[395] Although this deadline exists, the *Position Paper* acknowledges the impracticality of the date.[396] The major downfalls are the logistical requirements for infrastructure, and the costs incurred.[397]

Another prominent concern is currently biofuels are still in the early stages of development.[398] Therefore, caution needs to be exercised with its implementation.[399] The benefit of implementing a flexible approach to varied

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[385] Ibid.
[386] Ibid at s3(4)(a).
[387] Ibid.
[388] Ibid.
[389] Ibid at s3(4)(a)-(b).
[390] Ibid.
[391] Standards Regulations s5(1)(a)(ii).
[392] Ibid at s5(1)(a)-(k).
[393] *Position Paper* 9. The value, the Bioethanol Blending Value, assisted in quantifying the relative positives and negatives of the mixture.
[394] Ibid at 11.
[395] Ibid. Pricing will be discussed later in this chapter, refer 3.2.5. at 56.
[396] Ibid at 16.
[397] Ibid.
[398] Ibid.
[399] Ibid.

percentages required of the total national fuel pool is recognised in the *Position Paper*.[400]

This fuel pool comprises all current petrofuel manufacturers.[401] This percentage variation would account for only certain manufacturers across the country, according to geographic scope.[402] The scope would most likely be in close proximity to the biofuel production plants.[403] This allowance results in more beneficial results, and a goal to aim towards for the remaining manufacturers, rather than instilling the illusion of failure.[404]

This highlights the issue of location which both biofuel policies fail to address.[405] Not only is location a crucial factor for the prescription of mandatory blending, but also for biofuel types chosen to be produced.[406] The policy context gives effect to the careful selection of project criteria in the *Efficiency Strategy*.[407] As it forms a stepping stone towards the enforcement of the National Energy Act,[408] the *Efficiency Strategy* should also direct the selection of criteria for energy related projects. However, it currently fails to do so and subsequently the National Energy Act fails to enforce the prescription of criteria.

Transport of final blended products is a point of contention for manufacturers and wholesalers.[409] Alternative means of transport for biofuels in the post-production phase are evaluated in the *Position Paper*.[410] It is a major factor when considering the cost implication of transporting fuels.[411]

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[400] Ibid.
[401] *Industrial Strategy* 24.
[402] *Position Paper* 16.
[403] Ibid.
[404] *Industrial Strategy* 9.
[405] *Position Paper* 16.
[406] Ibid.
[407] *Efficiency Strategy*.
[408] Refer 2.1.2. at 19.
[409] *Industrial Strategy* 9.
[410] Ibid at 17.
[411] Köhler J, Walz R & Marscheider-Weidemann F "Eco-Innovation in NICs: Condition for Export Success with an Application to Biofuels Transport" 2014 (23) *Journal of Environment and Development* 134.

The transportation issue is addressed by focusing on where blending should primarily take place.[412] The blending process could occur at either depot or refinery level.[413] Ethanol and water possess a natural chemical affinity for each other.[414] Therefore, the biofuel mixture cannot be sent via an established pipeline network from refinery to depot.[415] Any remaining water will be picked up and integrated into the biofuel mix,[416] inevitably decreasing the blend percentage.[417]

In South Africa this causes a problem. There currently exist two major pipeline networks for the transfer of petrofuels.[418] There are numerous other lines that are used for other fuel transportation that cannot be utilised in this new age of petrofuels.[419] This concern then requires all biofuel and blended products be transported via road and rail systems.[420] It seems to be progression by regression in the effort towards environmentally friendly alternative energy forms.[421]

As discussed earlier, crude forms of biodiesel have been found to accelerate pipeline degradation.[422] Both the major pipelines would not be

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[412] *Position Paper* 16.
[413] Ibid.
[414] Ibid. See further Amnuaypanich S, Patthana J & Phinyocheep P "Mixed Matrix Membranes Prepared from Natural Rubber/poly(vinyl alcohol) Semi-interpenetrating Polymer Network (NR/PVA Semi-IPN) Incorporating with Zeolite 4A for the Pervaporation Dehydration of Water-ethanol Mixtures" 2009 (64) *Chemical Engineering Science* 4908.
[415] *Position Paper* 17.
[416] Ibid.
[417] Ibid.
[418] Ibid. The two major pipelines: the New Multi-Product Pipeline, and the old Durban-to-Johannesburg Pipeline. See further: Pipelines International "South Africa Welcomes a Multiple Solution" March 2012 Available at: http://pipelinesinternational.com/news/south_africa_welcomes_a_multiple_solution/066999/ [accessed 21.02.15]; and Transnet "Transnet Pipelines" 2015 Available at: http://www.transnet.net/Divisions/PipeLines.aspx [accessed 21.02.15].
[419] *Position Paper* 17.
[420] Ibid.
[421] Recent studies revealed little of produced biofuels are being targeted at transportation of blended fuels themselves. See further: Köhler et al 2014 *JED* 136; Pradhan A & Mbohwa C "Development of Biofuels in South Africa: Challenges and Opportunities" 2014 (39) *Renewable Energy* 1090; and Maltitz G von & Setzkorn K "A Typology of Southern African Biofuel Feedstock Production Projects" 2013 (59) *Biomass and Bioenergy* 38.
[422] Nolte "Biodiesel" 16. Refer 1.1. at 7.

authorised to carry crude fuels, resulting in new environmentally conscious means of generating fuel yielding somewhat pointless.

The *Position Paper* makes no attempt to cover up these issues as has been the case in past legislation and policy.[423] Acknowledgment of the concerns that have arisen during development stage is the first step towards determining a viable solution.[424] A suggestion for the introductory phase is to incorporate a combination of both depot and refinery-based blending determined by the refinery locality.[425] The Pipelines Act would be an effective enforcing mechanism for this hybrid approach.

The *Position Paper* addresses changes to be implemented following reviews of the framework.[426] Presumably, the blend percentage increase will be the main objective of the review.[427] It is also stated that the decision concerning the locality of blending processes will be included.[428] It will also address the possibility of bettering the biofuels framework by further tightening general procedural standards.[429]

At this stage it needs to be highlighted that the *Position Paper* is presently a 'next step' in the production line of developmental biofuel implementation policies.[430] Therefore, it can be regarded as somewhat progressive.

These resounding issues need to be addressed through the legal framework. This can be done by implementing mandatory specifications for the blending of biofuels through the PPA, its relevant extensions, and the Pipelines Act.[431] The current legal framework does not adequately define the mechanisms through which mandatory blending should be instilled. Nor does

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[423] For example, the *Industrial Strategy* 2007.
[424] Pradhan & Mbohwa 2014 *RSER* 1093.
[425] *Position Paper* 17.
[426] Ibid.
[427] Ibid.
[428] Ibid.
[429] Ibid.
[430] Pradhan & Mbohwa 2014 *RSER* 1090.
[431] Referring to the future Blending Regulations and the Standards Regulations.

it outline a response to the prevailing challenges of nation-wide blending.[432] This too can be enforced through the PPA.[433]

Furthermore, the issue of transportation needs to be outlined in the relevant legislative vehicles, namely, the PPA, Pipelines Act, and Standards Act.[434] All play integral components in the future prescription of mandatory blending.[435] Facilitating mechanisms need to be drawn up for the enforcement of these blending requirements.[436] SANS should be pinpointed to include this criteria in its prescription, which imposes governance through the Standards Act.[437]

3.2.3. Licensing and permits

In South Africa, the precautionary approach has been adopted for the implementation of liquid biofuels.[438] A sustainability criterion has been included in new policy frameworks for the governance of future biofuel regimes.[439] For the precautionary approach to be effectively implemented, licensing and permitting procedures need to be implemented into biofuel regulatory mechanisms.[440]

All processed biofuel manufacturing license applications up to 2014 were documented in the *Position Paper*.[441] It specifically lists the status of each application for public comment, including the proposed size and capacity of each proposed plant.[442] It further highlights that the total capacity projected as a result of the licensing applications would exceed the perceived

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[432] Köhler et al 2014 *JED* 136.
[433] Through the PPA, the relevant mechanisms can be outlined via schedules and extensions i.e. Blending Regulations, Standards Act, or Standards Regulations.
[434] Biofuel's transportation issue is unpacked in Köhler et al 2014 *JED* 136.
[435] Especially with the Blending Regulations not in force yet.
[436] Through the PPA, the relevant mechanisms can be outlined via extensions i.e. Blending Regulations and Standards Regulations.
[437] SANS.
[438] *Position Paper* 12.
[439] Ibid.
[440] Ibid.
[441] Ibid at 13, Table 1.
[442] Ibid.

2 per cent blend penetration in the national liquid fuel supply.[443] As exciting as this projection is, no infrastructure has been put in place, therefore none are in operation yet.[444] Thus far, the lack of an appropriate biofuels pricing mechanism has contributed to this shortcoming.[445]

The DoE developed a set of criteria listed in the PPA for the licensing of biofuel manufacturers.[446] The criteria integrated the conditions of the PPA with sustainability issues highlighted in the *Industrial Strategy.*[447] Both the policy and the law have been used as a point of reference by the DoE when evaluating biofuel manufacturing license applications.[448]

The Petroleum Products Amendment Act,[449] the 2003 PPA amendment, required licensed liquid fuel producers and wholesalers to supply and sell selections of petroleum products based on vegetable matter.[450] This amendment became an integral legislative vehicle for the development of the biofuels industry in South Africa.[451]

The existing licensing regulations for biofuels manufacturers are relatively comprehensive. The Standards Regulations are reflected in the future schedule for Blending Regulations.[452] This adds an additional layer of enforcement as both extend from the PPA.[453] The supplementary layer is seen through the issuing of a licensee to keep all records of purchase, including all petroleum product sale transactions.[454] Issued licence holders are obligated to submit a volumetric report of all biofuel manufacturing and sales on a monthly basis.[455] The report is also required to include the names

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[443] Ibid at 13.
[444] Ibid.
[445] Ibid.
[446] PPA.
[447] *Position Paper* 12.
[448] Ibid.
[449] Petroleum Products Amendment Act (No. 58 of 2004) Republic of South Africa.
[450] Ibid at Aim.
[451] *Industrial Strategy* 6.
[452] Blending Regulations s5(1).
[453] Standards Regulations s9(1)-(2).
[454] Ibid.
[455] Blending Regulations s5(1)(a)(i)-(iii).

of the recipients and the volume percentages of each sale.[456] The information is then submitted to the Controller of Petroleum Products, authorised by the PPA.[457] This avenue of control is suitably layered and creates a stable ground for which licensing requirements can be issued.[458]

Additionally, the Mineral and Petroleum Resources Development Act[459] (MPRDA) supports the issuing of license applications through penalties imposed on any unauthorised amendments or variations made to permits.[460] Further support is supplied through the Pipelines Act and the subsequent Pipelines Regulations, which provide guidelines for applications. As mentioned previously, the Pipelines Act assisted in putting NERSA into effect.[461] Although the NERSA guidelines undoubtedly form an additional licensing layer, they will need to be amended to specifically include petroleum and diesel blends. NERSA also gives effect to license applications rules under the PPA.[462] They have subsequently resulted in an attachment to the Pipelines Act that can be easily amended.[463]

A promising layering introduced by the MPRDA is the address to environmental management through its permitting authorisations.[464] The Act defines rules and accompanying procedures for numerous rights and permits.[465] The definitions are all specific to petroleum resources, but separated as follows: reconnaissance permits; exploration rights; technical co-operation agreement permits; and production rights.[466] These distinctions

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[456] Ibid.
[457] Ibid.
[458] Ibid.
[459] Mineral and Petroleum Resources Development Act (No. 28 0f 2002) GG No. 23922 Republic of South Africa.
[460] Ibid at ch7, s102.
[461] Pipelines Regulations s(A). Refer 3.2.1. at 37.
[462] "Legislation Overview". These rules are known as Petroleum Pipelines Act Rules, Part One: Licensing 2006 Rules in Terms of Petroleum Pipelines Act (No. 60 of 2003) Government Notice R. 1072 GG No. 32704, 2009 Department of Energy, Republic of South Africa.
[463] Ibid.
[464] Glazewski *Environmental Law* 497.
[465] MPRDA ch6.
[466] Glazewski *Environmental Law* 497.

have been compared to the exceptionally layered provisions for mineral prospecting and permitting rights.[467] In that case, prospecting for petroleum resources would require the submission of an Environmental Management Plan (EMP).[468]

Furthermore, the MPRDA gives effect to the production right.[469] This production right is briefly addressed as being "granted in terms of section 84",[470] thereafter giving no further definition.[471] This could be a niche the future biofuel regulatory regime could elaborate on. A production right would instil an obligation on manufacturers to abide by the specifications ordered on permit holders, similar to those outlined for prospecting rights in the MPRDA.[472]

The role of licensing and permitting would not only be to regulate the production of biofuels and the relevant quantities allowed in the different types and blends, but also to serve as guidelines for the exploration of biofuel generation. In the case of mineral exploration rights in terms of the MPRDA, a designated authority must approve the exploration according to a prior approved EMP.[473] Exploration in this case would not be exact to the mining definition,[474] but would encompass a more trial-like phase for biofuel production procedures. This is an integral component for biofuel regulation to implement in its beginning stages.[475]

The MPRDA would be a solid vehicle through which permitting procedures could be enforced for biofuel producers.[476] Specific details required for effective permitting measures are currently lacking in the legal framework proposed for biofuel regulation. Through the MPRDA important

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[467] Ibid.
[468] MPRDA ch4, s39.
[469] Ibid at ch1.
[470] Ibid; Glazewski *Environmental Law* 498.
[471] Ibid.
[472] MPRDA ch6.
[473] Ibid at ch4, s39(4).
[474] Ibid.
[475] Amigun et al 2011 *RSER* 1365.
[476] MPRDA ch4.

elements can be effectively regulated, such as: the nature and scope of permitting procedures; permitting authorities; specific procedures and processes; permitting review; and permitting amendments and renewals.[477]

3.2.4. Reference crops

Reference crops, also known as feedstocks, have aroused a few issues amongst policy developers.[478] The concern surrounds which crops are best suited to be utilised in the production of biofuels according to their region.[479]

Studies over the last decade have found effects of certain proposed biofuel feedstocks to be negatively affecting the sectors of which those crops directly compete with, namely food production.[480] The most ideal feedstock prospects are specifically linked to the type of biofuel it will be converted to.[481]

The *Position Paper* bares mention to specific reference crops for the production of biofuels.[482] However, the *Industrial Strategy* circulated various feedstock options, highlighting the relative positives and fall backs of each.[483]

For biodiesel, one of the best prospects is a non-edible plant such as linseed, cottonseed, and *Jatropha curcas* (Jatropha).[484] These are considered feedstocks of high potential due to the ability to grow in a wide variety of climates, and sustain long periods in absence of water.[485] For bioethanol, the issue remains over sugar cane as the primary feedstock, and

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[477] Ibid.
[478] Amigun et al 2011 *RSER* 1362.
[479] Ibid.
[480] O'Hare M, Plevin R, Martin J, Jones A, Kendall A & Hopson E "Proper Accounting for Time Increases Crop-based Biofuels' Greenhouse Gas Deficit versus Petroleum" 2009 (4) *Environmental Research Letters* 1.
[481] Amigun et al 2011 *RSER* 1362.
[482] *Position Paper* 16.
[483] Ibid at 18; *Industrial Strategy* 13.
[484] Kumar A & Sharma S "An Evaluation of Multipurpose Oil Seed Crop for Industrial Uses (*Jatropha curcas* L.): A Review" 2008 (28) *Industrial Crops and Products* 2.
[485] Dillon H, Laan T & Dillon H *Biofuels – At What Cost? Government Support for Ethanol and Biodiesel in Indonesia* 2008 Global Subsidies Initiative of the International Institute for Sustainable Development Geneva, Switzerland 27.

how close the price range will be to that of sugar.[486] Sugar molasses and cassava have also been used as bioethanol feedstock in developing countries in the past.[487]

With advanced technology, the future may see both bioethanol and biodiesel produced from the same feedstock.[488] For the present, biofuel production requires guidelines on specific feedstocks for different biofuel types.[489]

In order to offset the concern over food security, it was proposed in the *Industrial Strategy* that maize be excluded for biodiesel production.[490] This was done due to concerns regarding maize as the primary feedstock for biofuel generation.[491]

The *Industrial Strategy* proposed feedstock crops for South African production of biodiesel as soybeans, canola and sunflower, and for bioethanol, sugarcane and sugar beet.[492] These biodiesel feedstocks have been chosen in light of trends in global growth rates of palm oil consumption.[493] The price of crude palm oil is also expected to rise steadily in response to the high demand.[494] However, these choices are not adequately reflected in the legal framework. The specific exemption methods and processes of determination are required to be completely transparent in selection.[495]

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[486] Mathews 2007 *EP* 3551.
[487] Indonesia has been successful with three large commercial-scale bioethanol projects. See further *Biofuels Cost* 28.
[488] *Biofuels and Food Security* 16.
[489] Amigun et al 2011 *RSER* 1365.
[490] Letete & von Blottnitz 2012 *BSDA* 193.
[491] Ibid.
[492] Esterhuizen D *South African Biofuels Annual Report* 2009 USDA Foreign Agricultural Service GAIN Report 6.
[493] It is predicted that global consumption of palm oil will continue to grow at a rate of 3.2 per cent each year by the non-food sector. This percentage includes energy. See further *Biofuels Cost* 26.
[494] Ibid.
[495] Ibid.

Another major issue surrounding the choice of reference crops is the type of land development it will occur on.[496] Specifically, the *Industrial Strategy* targeted production onto 'new and additional' land, as well as 'currently under-utilised' land.[497] However, it makes no attempt to define these terms.[498] The lack of clarity slowed the process of acquiring stakeholders and many interested parties across the biofuel sector.[499] These terms do not effectively identify the means to acquiring an efficient use of land,[500] nor do they take into account that arable land is hard to come by in South Africa.[501]

The success of biofuels as a low-carbon source of energy is dependent on production methods and locations.[502] Reference crops can be planted on degraded land to minimise further habitat destruction.[503] Waste biomass and dumping grounds can also be utilised for biofuel crops.[504] Biofuels cannot be expected to alleviate the energy crisis if the feedstocks are planted on land that can be otherwise used.[505]

The process of determining target areas for biofuel production is also required to be reflected in the legal framework.[506] Through an extension of the PPA, a schedule could be developed to target these methods of determination.[507]

To efficiently select reference crops, the relevant prices of available options need to be considered.[508] In order to do this, the *Industrial Strategy*

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[496] Letete & von Blottnitz 2012 *BSDA* 196.
[497] Ibid; *Industrial Strategy* 3.
[498] Letete & von Blottnitz 2012 *BSDA* 196.
[499] Ibid at 197.
[500] Letete "Modelling" 3.
[501] Ibid. Arable land is extremely limited, currently only 14 per cent of South African land receives adequate rainfall to sustain arable crop production.
[502] Ibid at 30.
[503] Ibid.
[504] Ibid.
[505] For example, in food production. See further O'Hare et al 2009 *ERL* 1.
[506] Letete "Modelling" 3.
[507] Similarly with the Standards Regulations.
[508] *Position Paper* 15.

developed pricing models.[509] The assumed feedstocks used to develop the pricing model assumptions were grain sorghum for bioethanol, and soya beans for biodiesel.[510] Although Jatropha is an economically viable option as a reference crop, its use in South Africa is currently ill-considered, as it holds many biodiversity threats.[511]

Certain feedstocks have been acknowledged for biofuel production,[512] which the *Position Paper* has now expanded on.[513] The determination of feedstock crops goes beyond pricing model assumptions however.[514] It is a complex process, and technical exclusions could amount as a result of non-recognition of certain crops.[515]

The pricing model assumptions assisted in the development of the Pricing Framework.[516] This pricing mechanism was delayed for a significant amount of time prior to the release of the *Industrial Strategy*.[517] The main reason for this delay was in response to issues and concerns being raised by potential end-users of feedstock crops.[518] Sorghum, the feedstock concerned, was being pinpointed as the only reference for bioethanol production at the time.[519] Although at that point, it was being excluded from feedstock options.[520]

The concern focused on the doubts of a singular-based model.[521] Specifically, potential buyers, producers, and users were refusing to invest in

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[509] Ibid. The pricing models will be discussed later in this chapter, refer 3.2.5. at 59.
[510] Ibid.
[511] *Position Paper* 18. Jatropha is an alien plant to South Africa that possesses extremely toxic pods and leaves. See further Everson C, Mengistu M & Gush M "A Field Assessment of the Agronomic Performance and Water Use of *Jatropha curcas* in South Africa" 2013 (59) *Biomass and Bioenergy* 60.
[512] *Position Paper* 18.
[513] Ibid.
[514] Ibid.
[515] Ibid.
[516] Discussed in the next sub-heading, refer 3.2.5. at 56.
[517] *Position Paper* 18.
[518] Ibid.
[519] Ibid.
[520] Ibid.
[521] Ibid.

the venture if only one feedstock was being utilised.[522] However, it became apparent that whichever was pinpointed as the crop of choice, concerns would be raised and investment refusals would be waved.[523] Only feedstocks that have been previously identified as supporting the biofuels target will be supported through a manufacturing licence.[524]

Nonetheless, alternative methods were sourced to integrate other feedstocks in order to regulate the duress.[525] Hence the BTT, together with the National Treasury and the DoE, placed the Pricing Framework on hold until suitable models could be developed for the effective structuring of reference crops.[526]

The future legal framework needs to incorporate these concerns into its regulation. The selection of feedstock alternatives should be described and a method should be outlined as to which crop suits designated locations. This could further be enforced through an extended schedule of the PPA.[527]

For policy makers to make an educated feedstock recommendation for biofuel production in South Africa, three options for crop consideration were pitched.[528] The selection covered: multiple crops of reference;[529] focusing on only a singular feedstock per biofuel type;[530] and an 'entirely crop-neutral' process. The latter would involve bidding from prospective manufacturers against a set list of government-issued criteria.[531]

The last option would entail a process under authorisation of the REIPPPP.[532] The REIPPPP would issue a set of licensing criteria to be met

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[522] Ibid.
[523] Ibid.
[524] *Industrial Strategy* 13.
[525] *Position Paper* 18.
[526] Ibid.
[527] The PPA should give effect to the selection of crops based on social, climate and topographical attributes similar to the Standards Act.
[528] *Position Paper* 19.
[529] Ibid. The consideration of more than one crop was deemed prudent considering the biofuels framework was still in a pilot phase.
[530] Ibid at 20. This only considered the most efficient feedstock at the time.
[531] Ibid at 23.
[532] Ibid.

in order for consideration in the bidding process.[533] As previously mentioned, REIPPPP adds a layer of environmental awareness into the selection of project criteria, in this instance, with feedstock options.[534]

The study conducted by the BTT and the National Treasury to determine an alternative method to choosing reference crops was intensive.[535] It considered an array of feedstock options for South Africa's progress on the implementation of biofuel development.[536] The recommended route emerged as focusing on single feedstocks for each fuel type.[537]

Again, this method of determination has not been effectively documented in the legal framework. It should be entrenched through the PPA and combined with the regulatory mechanisms for licensing and permitting.[538]

The most common feedstocks for the production of bioethanol worldwide are identified as sugarcane and maize.[539] Global biodiesel markets are still unsure of the chosen feedstock options.[540] Following the study mentioned above, the main proposed crops were put through the Pricing Framework.[541] As a result, the newly proposed feedstocks for production in South Africa are: soya beans and sunflower seeds for biodiesel; with grain sorghum and sugarcane for bioethanol.[542]

The recommended option for South African biofuel production is further stated, that only grain sorghum and soya beans should be considered

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[533] Ibid at 24.
[534] *Industrial Strategy* 5.
[535] *Position Paper* 24.
[536] Ibid.
[537] Ibid.
[538] Through the Standards Regulations for example.
[539] *Position Paper* 18.
[540] See further: Tang Z-C, Zhenzhou L, Zhiwen L & Ningcong X "Uncertainty Analysis and Global Sensitivity Analysis of Techno-Economic Assessments for Biodiesel Production" 2015 (175) *Bioresource Technology* 503; and Gülşen E, Olivetti E, Freire F, Dias L & Kirchain R "Impact of Feedstock on the Cost-effectiveness of Biodiesel" 2014 (126) *Applied Energy* 282.
[541] As well as other studies that will be addressed later in this chapter, refer 3.2.5. at 56.
[542] *Position Paper* 18.

as feedstocks for bioethanol and biodiesel, respectively.[543] However, it does not go so far as to explicitly state that other feedstocks may not be utilised in the implementation phase.[544] Decisions by manufacturers to utilise other feedstocks is not deterred, provided that educated decisions are made to incorporate the economic viability of the crops' mass production.[545] This technique of non-exclusion is based on the premise that whoever wishes to be granted subsidiary rights due to feedstock choice would first be required to meet certain criteria before qualifying as a beneficiary.[546]

This policy mechanism undoubtedly marks the progressive nature of the law-makers and the reality that flexibility is imperative in making frameworks of this nature survive.[547] However, it draws a question as to who the delegated authority is that decides what constitutes an 'educated decision'. Through policies such as the *Subsidy Scheme*, the recommended feedstock options could be supported on a fiscal basis.[548] It also reveals that a definition of a competent authority is required within the legal framework.[549] The PPA could incorporate this aspect into its enforcement.

Another notable aspect of the *Position Paper* is the commitment to follow up on rejected feedstock options once the implementation phase is underway.[550] There is a suggestion that monitoring and evaluation of the initial phase should utilise the time to consider the rejected crops.[551] The consideration should take into account the processes underway, and engage with the government to assess the state of the sugar industry in particular.[552]

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[543] Ibid at 24.
[544] Ibid.
[545] Ibid.
[546] Ibid.
[547] Scott D, Hitchner S, Maclin E & Dammert B "Fuel for the Fire: Biofuels and the Problem of Translation at the Tenth Conference of the Parties to the Convention on Biological Diversity" 2014 (14) *Global Environmental Politics* 85.
[548] *Industrial Strategy* 7.
[549] Amigun et al 2011 *RSER* 1366.
[550] *Position Paper* 24.
[551] Ibid at 25.
[552] Ibid.

The monitoring aspect is promising, however it will fall short if it is not supported by the correct legislative vehicle.[553]

These small clauses have the potential to become instrumental for the longevity of the *Position Paper*. However, the clauses need to be effectively illustrated within the legal framework to allow them to become instrumental. Regulation via the PPA and extended schedules will build the much needed authoritative voice the selection of feedstocks requires.[554]

3.2.5. Pricing

Energy pricing has been concluded to drive price levels in agriculture, eventually causing them to fluctuate.[555] Ultimately, this results in energy markets becoming unstable.[556] It has also become clear that in this new clean energy era, energy prices play an integral role in the coordination between agricultural markets and their relative commodity prices.[557]

With the development of the biofuels industry growing steadily in South Africa,[558] it is expected that relative spheres will be significantly influenced. The economic and social sectors are two important spheres to consider, notwithstanding the biophysical environment as a central focus.[559] In order to grasp investors' attention and acquire financial commitments, the venture needs to portray itself as financially viable.[560]

Focusing on a singular modelling aspect has become known as the 'common' way for assessing the economic viability of biofuel development

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[553] Ibid.
[554] PPA ch4.
[555] Serra T & Zilberman D "Biofuel-related Price Transmission Literature: A Review" 2013 (37) *Energy Economics* 141.
[556] Ibid.
[557] Hertel T & Beckman J "Commodity Price Volatility in the Biofuel Era: An Examination of the Linkage between Energy and Agricultural Markets" in Graff Zivin J & Perloff J (eds) *The Intended and Unintended Effects of U.S. Agricultural and Biotechnology Policies* 2011 University of Chicago Press, Chicago 189.
[558] *Industrial Strategy* 5.
[559] Letete "Modelling" 42.
[560] Ibid. It is considered viable if there is suitable return on the investment in a specific time period.

projects.[561] This singular facet is the cost of the addition of the processing plant, covering transportation costs, time, labour, energy, and all consumables.[562] As plans for development grows and action is further halted, it becomes prevalent that the singular aspect of value in the economic model does not suffice.[563] Furthermore, it shows that the previously ignored economic benefits need to be incorporated into a model to determine pricing.[564]

With the growing production of biofuel, the most important effect to consider is the shift in nature of the link between the energy market and agricultural product prices.[565] Energy prices have traditionally affected agricultural prices due to their production cost.[566] However, the upsurge of the biofuel movement has fluctuated prices due to the increased use of agricultural products as biomass for the production of biofuel.[567] This has resulted in an increased demand for agricultural crops used as feedstocks for biofuel production.[568] Overall, this promotion has boosted the implementation of biofuel projects.[569]

Energy modelling can be used to structure and analyse different bioenergy systems.[570] It is essential to integrate life-cycle assessment tools to adequately analyse environmental and social impacts.[571] A review conducted by Letete in 2009 revealed multiobjective optimisation as the best available method to suitably analyse all three spheres.[572] The model would

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[561] See further Bureau for Food and Agricultural Policy *Modelling the Impacts of Macroeconomic Variables on the South African Biofuel Industry* 2007 Pretoria 1-28.
[562] Letete "Modelling" 42.
[563] Ibid.
[564] Ibid.
[565] Peri & Baldi 2010 *EE* 687.
[566] Amigun et al 2008 *RSER* 691.
[567] Peri & Baldi 2010 *EE* 687.
[568] Ibid.
[569] Ibid.
[570] Letete "Modelling" 112.
[571] Ibid.
[572] Ibid. Multiobjective optimisation is a combination of methods integrated to analyse problem. The aim is to organise diverse stakeholders into some level of agreement. See further Letete "Modelling" 27.

incorporate the economic gain afforded to the processing plant, the job creation that would stem from the operations, the reduced atmospheric emissions, and the overall decrease in arable agricultural land.[573]

The economics of biofuel production can be optimised when both costs and logistics are minimised.[574] This minimisation can be represented in a pricing model.[575] If multiobjective modelling is the option that incorporates all integral aspects into one system,[576] then it is an important avenue to consider.

With the initiation of the *Position Paper*, South Africa has significantly enhanced its position in the developmental and renewal energy sector. The path laid out for the biofuels industry by this and the *Industrial Strategy* may serve well to embed a tangible approach method to price modelling.

The *Industrial Strategy* was based on five main premises.[577] One of these was the orientation to create a reliable market for biofuels through the combination of biological resources and the fuels market.[578] The *Position Paper* then created the Pricing Framework,[579] which allows for: provisions for investments in bioethanol and biodiesel manufacturing sectors; reduced and overall limited manufacturing costs; legitimate investment returns; a break-even point on manufacturing costs; and the applicable levels to which manufacturing entities will be subsidised.[580] These grounds, however, are not effectively reflected in the legal framework.

Another premise of the *Industrial Strategy* is the aim of determining the optimum sales price of the biofuel blending components.[581] Specifically

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[573] Ibid.
[574] *Industrial Strategy* 22.
[575] Ibid.
[576] Letete "Modelling" 112.
[577] *Industrial Strategy* 12.
[578] Ibid.
[579] *Position Paper* 18.
[580] Ibid.
[581] *Industrial Strategy* 12.

the goal was to peg down the price to ensure costs associated with the running of a biofuels plant were covered.[582]

The Pricing Framework incorporates both these premises into its objective.[583] More specifically, the DoE focused its attention on two projects that would form the baseline for the Pricing Framework.[584] These projects can be briefly summarised. The first, the Biofuels Break-even Price Determination project, is a study that determines the price at which manufacturers would break-even, on either bioethanol or biodiesel.[585]

The second project undertaken, the Bioethanol Blending Value project, also involved a study.[586] It sought to determine the value of blending bioethanol into regular petrofuel and distributing to end users.[587] This project aimed to estimate the nature of the outcome of investment facilities on blending operations, and to determine the effect of overall operations.[588]

In a generalised approach the outlined pricing models are based on feedstocks to calculate the necessary biofuel incentives.[589] The models include variables such as cost information, average local pricing, fixed turnover, and capital expenditure costs.[590] This pricing model helps to formulate the incentive that can be awarded.[591]

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[582] Ibid.
[583] *Position Paper* 18.
[584] Ibid.
[585] Ibid. This value is derived according to a biofuel operations plant under efficient operation with a rate of return on assets (ROA) of 15 per cent. This ROA is calculated according to earnings by the manufacturer, before interest and tax deductions, divided by the total worth of assets. An ROA of 15 per cent is perceived as acceptable for a project such as biofuel production.
[586] Ibid.
[587] Ibid.
[588] Ibid. Thus far the blending value has been negative, however, at low blending percentage levels it has been found to be positive.
[589] Ibid at 19.
[590] Ibid. Here the 15 per cent ROA is quantified for all potential biofuel manufacturers.
[591] Ibid at 15. Incentive is determined by the monetary gap between earnings predicted from actual market ratings and earnings necessary to achieve the 15 per cent ROA.

The third premise of the *Industrial Strategy* was based on the expectation that the cost of biofuels would be ring-fenced.[592] This translates to biofuel costs being isolated from all other petrofuel costs.[593]

Through the Appropriation Act pricing models for biofuels can be supported.[594] The Appropriation Act serves to provide for the provision of money for the requirements of the country within a specific financial year.[595] One of the main objectives of the biofuels industry is for job creation and poverty alleviation.[596] The Appropriation Act also specifically states one of its purposes as the promotion for job creation.[597] Pricing factors could be significantly influenced through this avenue.

NERSA has established itself with a mandate the future biofuels framework would be well suited to follow. With NERSA's establishment in four primary acts,[598] it is entrenched into the subsequent levy and facilitating acts related to the primaries.[599] The Petroleum Pipelines Levies Act[600] would provide a suitable base for which biofuel pricing frameworks could develop.

NERSA is further facilitated through PFMA, the Promotion of Access to Information Act[601] (PAIA), and the Promotion of Administrative Justice Act[602] (PAJA).[603] NERSA sets tariff targets and pricing conditions.[604] A successful biofuel framework will need to facilitate itself through both PAJA and PAIA due to its sensitive nature as a pioneer concept in South Africa. It

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[592] *Industrial Strategy* 12.
[593] Ibid. The result of ring-fencing is that remuneration would be separated for biofuels end-consumers. A limited benefit would be presented on cost to the consumer by keeping the cost consistent in contrast to the fluctuations in oil and petrofuel.
[594] Appropriation Act (No. 9 of 2008) GG No.31266 Republic of South Africa.
[595] Ibid at Preamble.
[596] *Industrial Strategy* 5.
[597] Appropriation Act s5.
[598] Refer 2.1.2. at 20.
[599] "Legislation Overview".
[600] Petroleum Pipelines Levies Act (No. 28 of 2004) GG No. 27122 Republic of South Africa.
[601] Promotion of Access to Information Act (No. 2 of 2000) GG No. 20852 Republic of South Africa.
[602] Promotion of Administrative Justice Act (No. 3 of 2000) GG No. 20853 Republic of South Africa.
[603] "Legislation Overview".
[604] Ibid.

will do well to do this through the utilisation of NERSA as the regulatory coordinator for biofuels.

Instead of imposing penalties and giving minimal attention to the description of pricing schemes, the *Position Paper* conducts in-depth studies in order to formulate coherent pricing models.[605] The future of the biofuels regime requires a stronger supporting legislative structure for pricing allowances.

3.2.6. Incentives and support

With the rapid increase in biofuel production across many parts of the globe, feedstock substances are becoming more competitive.[606] This is especially so when the addition of incentives are incorporated into the production mechanism.[607]

Incentives are not always structured and packaged in the obvious form of remuneration for compliance.[608] In some cases incentives are housed by support programmes,[609] for example for emerging small-scale farmers specifically for crop selection and agricultural methods.[610]

Essentially a tax or a subsidy is an incentive-based approach.[611] Such programmes can be designed to have a control overlay for all operations under the support of the government.[612] This approach was taken with the *Industrial Strategy*.[613] The government thereby assumes responsibility for all training and capacity building.[614]

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[605] *Position Paper* 18-19.
[606] Ajanovic 2011 *Energy* 2072.
[607] *Review* 62.
[608] Peri & Baldi 2010 *EE* 687.
[609] Ibid.
[610] Ibid.
[611] *Review* 62.
[612] Ibid.
[613] Letete & von Blottnitz 2012 *BSDA* 193.
[614] Ibid.

Interesting to note in the wake of the DoE projects,[615] sorghum is pinpointed as the favourable crop for bioethanol production requiring the least subsidy amount.[616] For biodiesel, soya beans were ranked the best crop for production.[617] Incidentally, biodiesel production via soya beans also has a much more favourable decreased greenhouse gas emissions percentage.[618] This could be linked to the fourth and arguably most important premise of the *Industrial Strategy*:

> "Bio-Fuels (*sic*) are a key driver (…) for socio-economic development. Cabinet (…) approved the development of an industrial strategy targeted at creating jobs in the energy crops with the bio-fuels (*sic*) value chain, acting as a bridge from the second economy to the first economy status."[619]

For this reason alone the biofuels industry has shied away from using imported feedstock and focused on feedstocks available within South Africa.[620]

This can be intimately linked with the fifth and final premise of the *Industrial Strategy*, which targets biofuel production within the regions of South Africa that have historically suffered the most from poverty.[621] This notion is further entrenched in the *Position Paper*.[622]

With the huge support by governments for the market introduction of biofuels across the globe, and primarily in developing nations, there is a trend developing towards effective policies that define clear support mechanisms.[623] Generally there are a few noted forms these policies can

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[615] Refer 3.2.5. at 59.
[616] *Position Paper* 24.
[617] Ibid.
[618] Ibid at 14, Table 2.
[619] *Industrial Strategy* 13.
[620] Ibid.
[621] Ibid.
[622] *Position Paper* 9.
[623] Lamers P, Hamelinck C, Junginger M & Faaij A "International Bioenergy Trade – A Review of Past Developments in the Liquid Biofuel Market" 2011 (15) *Renewable and Sustainable Energy Reviews* 2656.

take:[624] via the push-method of enforcing mandates, or alternatively the pull-method of imposing tax incentives.[625] Additional subsidies can be provided for via capital investment support.[626] This support would primarily be aimed at covering infrastructure costs of the biofuel plants.[627]

The *Industrial Strategy* is a prime example of a poor support mechanism definition.[628] It did little to define the role of government support for biofuel production.[629]

Studies revealed the substantive difference between the economic viability of bioethanol projects compared with biodiesel ventures.[630] The proposed biofuel tax support offered by the *Industrial Strategy* would lead to losses on biodiesel for the manufacturer no matter the feedstock.[631] This has been attributed to the increased prices of virgin vegetable oil in South Africa, and why biodiesel has only been produced using recycled vegetable oil.[632]

Both pricing and incentive mechanisms need to be regulated through legal frameworks to support these premises.[633] Regulation through policy documents alone will not suffice with the implementation of incentives.[634] The issuing of subsidies requires strict enforcement guidelines.[635] These can be regulated through the *Subsidy Scheme*.[636] Regulatory tools are critical for subsidy and incentive control.[637]

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[624] Ibid.
[625] Junginger M, van Dam J, Alakangas E, Virkkunen M, Vesterinen P & Veijonen K "Solutions to Overcome Barriers in Bioenergy Markets in Europe – D2.2" 2010 *EUBIONET3 Resources, Use and Market Analysis* VTT-R-01700-10.
[626] Oosterveer P & Mol A "Biofuels, Trade and Sustainability: A Review of Perspectives for Developing Countries" 2010 (4) *Biofuels, Bioproducts & Biorefining* 70.
[627] Ibid.
[628] *Industrial Strategy* 9.
[629] Ibid; Letete & von Blottnitz 2012 *BSDA* 197. Studies revealed the extent of government support was insufficient for industries to be economically viable. See further: *Impacts* 1-28; Nolte "Biodiesel"; and Letete "Modelling".
[630] Letete & von Blottnitz 2012 *BSDA* 197. See further Letete "Modelling".
[631] Letete "Modelling" 62.
[632] Letete & von Blottnitz 2012 *BSDA* 197.
[633] *Industrial Strategy* 7.
[634] Ibid.
[635] Ibid.
[636] Ibid.
[637] Ibid.

Another means of an incentive is to add a producer support mechanism.[638] This would allow for the difference in biofuel tax support to be balanced through instating a fixed price margin.[639]

As previously mentioned, the main driver of the *Industrial Strategy* was job creation.[640] Although a valid and closely watched issue in a developing nation, it should not be highlighted as the single most important social objective in a biofuel implementation project.[641] The aim of creating jobs within the country should most definitely be incorporated into the criteria under which government support could be granted. However, centralising it as the main driver for a movement with a magnitude such as biofuels seems juvenile. The end goal of implementing biofuel production in a developing country is much larger: energy self-sufficiency and security; food security; poverty alleviation; and renewable technology generation; to name a few.[642]

In order for a government support system to be put in place that is efficient and justifiable, the competent authority needs to be identified and given controlling powers. Such authorities have been established,[643] but have been excluded from biofuel policies.[644]

The Comprehensive Agricultural Support Programme (CASP) is an initiative designed by the Department of Agriculture to provide the much needed post-settlement support to land beneficiaries.[645] Another programme aimed at supporting agricultural land reform is the Micro Agricultural Financial Industrial Scheme of South Africa (MAFISA).[646] MAFISA was formed under the umbrella of CASP to provide financial services to smallholder biofuel

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[638] Ibid at 4.
[639] Letete & von Blottnitz 2012 *BSDA* 193.
[640] *Industrial Strategy* 9.
[641] Letete "Modelling" 43.
[642] See further: *Industrial Strategy* 5; Amigun et al 2011 *RSER* 1361; and *Position Paper* 9.
[643] Letete & von Blottnitz 2012 *BSDA* 197.
[644] Evident by the lack of identification in the *Industrial Strategy*.
[645] Department of Agriculture *Progress Report of the Implementation of the Comprehensive Agricultural Support Programme (CASP)* 2004 Pretoria.
[646] Department of Agriculture, Forestry & Fisheries "Development Finance" 2014 Available at: http://www.daff.gov.za/daffweb3/Branches/Administration/Development-Finance [accessed 18.01.15].

producers.[647] However, even though such initiatives have been put in place, they are still failing.[648]

This failure can be attributed to the lack of concrete enforcement mechanisms. Introducing the *Subsidy Scheme* alone will not benefit the regulation of incentive and support mechanisms. This can only be done through the legal framework.[649]

Fiscal policies lead the way for enforcement, and the *Subsidy Scheme* should give effect to a legal regime that focuses on an outline for budgets for renewable energy techniques. The Standards Act should extend to regulations for incentive mechanisms as regulatory tools for initiatives such as biofuels.[650]

Another opportunity for developing countries producing biofuels is to export.[651] Biofuel mandates created by the government have the chance to unlock this market for the country, by offering subsidies for those manufacturers who choose to export.[652]

It is safe to presume that financial support systems up until this point have failed, and require significant work in order to develop a reputation as a reputable agricultural support system.[653] A thorough analysis needs to be conducted of the support systems that propose themselves out of government, especially to suit the support with the organisation, instead of creating a generic mechanism.[654] The degree of uncertainty when calculating subsidies offered to a manufacturer needs to be clarified in biofuel policies.[655]

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[647] "Development Finance".
[648] According to the Parliamentary Monitoring Group 2008, reported in Letete & von Blottnitz 2012 *BSDA* 198.
[649] Through legislative vehicles such as: PPA; MPRDA; PFMA; and the Employment Tax Incentive Act (26 of 2013) GG No. 37185 Republic of South Africa.
[650] Ibid.
[651] *Biofuels Cost* 34.
[652] Ibid.
[653] Letete & von Blottnitz 2012 *BSDA* 198.
[654] Ibid.
[655] Evident by the biofuels industry under the Indonesian Government. See further *Biofuels Cost* 36.

Furthermore, it needs to be clarified under law.[656] It is also critical that government assessments are performed.[657] These should be delivered in a transparent manner so as to demonstrate the governments' ability to deliver on their financial support commitments.[658]

The designation of a proposed General Fuel Levy is defined in terms of the CEA.[659] It is said to be an integral element associated with typical monitoring and evaluation processes of the *Industrial Strategy*.[660]

Effective asset management is through good governance and social progress.[661] The Appropriation Act refers specifically to the National Treasury providing asset and liability management.[662] It can be argued then that the process of biofuel development utilises the earth's resources. This contributes to social progress. Therefore, through the good governance of assets and living standards,[663] the Appropriation Act promotes the effective regulation of biofuel production.[664]

Through the Appropriation Act we can also see the promotion of unemployment reduction and a commitment by the government to actively take part in alleviating unemployment numbers.[665] Furthermore, the Appropriation Act promotes social progress through the creation of a positive environment in order to build a caring society.[666] The ultimate aim of this government support being towards sustainable development.[667]

The *Industrial Strategy* insufficiently supported the conclusion of government support and its role in the implementation of biofuel production in

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[656] Ibid.
[657] Letete & von Blottnitz 2012 *BSDA* 198.
[658] Ibid.
[659] CEA.
[660] *Industrial Strategy* 21.
[661] Appropriation Act s7(3).
[662] Ibid at s7.
[663] Ibid.
[664] Ibid.
[665] Ibid at s15.
[666] Ibid.
[667] Ibid.

South Africa.[668] What was determined can be summarised as not economically viable for industries that choose to implement biofuel production mechanisms.[669] Hence, the need was apparent for a policy that included a coherent structure for government support.[670] The *Position Paper* has since created a set of working rules to be implemented to measure against monthly inputs and outputs.[671] Perhaps reference to the Appropriation Act could have assisted in the clarification of government support within both strategies.[672]

These working rules are to determine the monthly biofuels transfer prices and levels of incentives for biofuels manufacturers.[673] The overall process will be reviewed bringing in the introduction of the BTT and its proposed administration, collection and disbursement of monies.[674] These rules, however, require enforcement through established mechanisms.[675] The most efficient channel would be through the Appropriation Act.[676]

Two projects were undertaken by the DoE to effectively determine a framework for the pricing of biofuels.[677] Following these projects, and the subsequent revised model, the Minister of Finance considered the outcomes in his 2013 *Budget Review*[678] and indicated a subsidy afforded to biofuel manufacturers.[679] The administration of the levy is obviously a critical point that needs to be considered prior to the implementation of the regulatory framework.[680]

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[668] Letete & von Blottnitz 2012 *BSDA* 197.
[669] This was determined following an array of studies. See further: *Impacts*; Nolte "Biodiesel"; and Letete "Modelling".
[670] Letete & von Blottnitz 2012 *BSDA* 197.
[671] *Position Paper* 30, Annexure E.
[672] Appropriation Act.
[673] *Position Paper* 30, Annexure E.
[674] Ibid.
[675] Ibid at 30.
[676] Appropriation Act.
[677] Discussed in the previous sub-heading, refer 3.2.5. at 59.
[678] *Budget Review* 27 February 2013 National Treasury, Republic of South Africa.
[679] *Position Paper* 14. This subsidy would be through a levy imposed on petrol and diesel.
[680] Ibid.

With the general fuel levy of 50 per cent exemption imposed on biodiesel manufacturers, biodiesel may actually grow into an attractive plant proposal.[681] For the present, biodiesel manufacturing has taken a backseat against bioethanol,[682] as the risk of entering into the cooking oil business is too high when starting up an industry.[683] However, the issue that resounds to manufacturers who are faced with the prospect of implementing biofuel schemes into their production line is the matter of incentives.[684]

There is concern for the transportation of blended petrofuels.[685] It is worthwhile mentioning, in South Africa blending at the depot will have further implications than just transport costs if blending had occurred at refinery level.[686] These costs arise in the form of fuel tax dictated by the CEA.[687] Fuel tax is determined on different levels and according to SARS.[688] Fuels blended at depot level trigger fuel tax as duty at source.[689] Therefore, the overarching legal framework reveals itself to be the CEA.[690] Regulation via the CEA and the Appropriation Act together would effectively manage the direction for incentives and support mechanisms. It is important to have a legal body enforcing the regulation of incentive allocation.[691] This is especially so with an initiative such as biofuel production, where renewable energy policies are triggered as well.[692]

Another legislative factor to consider is through the PPA, which regards blending to be included in the manufacturing process of fuel.[693] Ethanol blending is to be included as a 'fuel levy good', which would result in the suite of fuel levies, taxes, and all accompanied duties, be collected at the

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[681] Ibid.
[682] Ibid.
[683] Ibid at 15.
[684] Alvarez 2009 *LR* 130.
[685] *Position Paper* 17. Mentioned earlier in this chapter, refer 3.2.2. at 42.
[686] Ibid.
[687] CEA s27. See further *Position Paper* 17.
[688] Ibid.
[689] Ibid.
[690] Ibid.
[691] *Position Paper* 17.
[692] Ibid.
[693] PPA.

point of manufacture.[694] This amendment has already been made to include biodiesel.[695] The inclusion as a fuel levy product would require the depots to become registered with SARS.[696] This would be obligatory unless further amendments are made to the legislation that would exclude the blending of biofuel as a manufacturing action.[697]

This structure illustrates the need for industries to be incentivised.[698] Supply may otherwise not match increasing demand.[699] Incentives are viewed as an offering that hopes to encourage private entrepreneurs to utilise their own lands.[700] The collaboration of the critical overarching legislative vehicles is extremely important in the regulation of incentive mechanisms.[701] The Appropriation Act, the CEA, and the PPA, could all integrate tools in their frameworks to better regulate these incentives.

3.2.7. Environmental management

The integration of environmental protection mechanisms in the future governance of biofuels is indistinct.[702] Neither the *Industrial Strategy* nor the *Position Paper* refers to practices to be implemented to conserve the environment nor to take measures to prevent the disruption of the sensitive ecosystems.

The legislative backbone for renewable resource policy building, the MPRDA, highlights the government's acknowledgement of the need for environmental awareness:

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[694] *Position Paper* 17.
[695] Ibid.
[696] Ibid.
[697] Ibid.
[698] Alvarez 2009 *LR* 130.
[699] Ibid.
[700] *Transcript of Senate Proceedings (TSP)* 23 May 2006 Sponsorship Speech of Senator Santiago 13th Conference Proceeding, 2nd Regular Session, No. 86. Interpellation during the second reading.
[701] Ibid.
[702] Evident by the complete lack of environmental protection measures in either the *Industrial Strategy* or the *Position Paper.*

> "…AFFIRMING the States' obligation to protect the environment for the benefit of present and future generations, to ensure ecologically sustainable development of mineral and petroleum resources and to promote economic and social development;"[703]

This entrenchment of sustainable development principles binds the MPRDA. It also creates an obligation on South Africa as a nation, not just the government, to instil in all practices an environmental conscience.[704] The MPRDA refers back to the National Environmental Management Act[705] (NEMA), of which holds the legislation that trumps all other environmental measures in South Africa.[706]

The role of NEMA and the MPRDA has been tried before in highly debated cases. The status of the MPRDA was specifically tested against both the Cape Land Use Planning Ordinance,[707] and NEMA, in the series of *Maccsand*[708] cases from 2010 to 2012.[709] The result of the court was the same in all three cases.[710] The MPRDA does not have the power to override municipal authorities to authorise land uses in specific jurisdictions, and hence the MPRDA does not undermine NEMA.[711]

The fact that the MPRDA refers to NEMA to further instil its principles clarifies an important discussion point.[712] The objectives of providing prospective rights to alternative resource developers are not to tear through the landscape with a singular goal in mind.[713] The environmental conscience

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[703] MPRDA at Preamble.
[704] Ibid.
[705] National Environmental Management Act (No. 107 of 1998) GG No. 19519 Republic of South Africa.
[706] Ibid.
[707] Cape Land Use Planning Ordinance (No. 15 of 1985) Western Cape, Republic of South Africa.
[708] See further: *Swartland Municipality v Louw NO & others* 2010 (5) SA 314 (WC); *City of Cape Town v Maccsand (Pty) Ltd & others* 2010 (6) SA 63 (WC); and *Maccsand (Pty) Ltd & another v City of Cape Town & others* (*Chamber of Mines* as *amicus curiae*) ([2011] ZASCA 141, decided 23 Spetember 2011)).
[709] *Mining and Environment Litigation Review* 2012 Centre for Environmental Rights 9.
[710] Ibid.
[711] It was also ordered that the MPRDA does not have the power to trump the Cape Land Use Planning Ordinance. See further *Mining* 9.
[712] MPRDA ch4, s37.
[713] Ibid.

is embedded in legislation integral to the future of mining development in South Africa.[714] Therefore the question should be asked why it cannot be the same for renewable energy development.

Furthermore, the MPRDA states that an EMP be coordinated.[715] There appears to be no such principle in either of the policies proposed for biofuel regulation in South Africa.[716] This marks a major shortfall of the future biofuels regulatory framework.

The MPRDA attempts to cover environmental protection for all petroleum and mineral proceedings.[717] This includes the production of biofuels.[718] It uses soft language when imposing that the Minister "may" authorise regulations that serve to protect the environment.[719] The list that may be regulated is fruitful in description, addressing the need to establish EMPs, prevention and control of polluting materials, and rehabilitation, amongst others.[720] However, the enforcement is mild and adds little to the biofuels policy structure so as to contribute to a successful legal framework.

Furthermore, the MPRDA designates mineral and environmental regulation applicable to petroleum.[721] The environmental management principles applicable to petroleum however, are equivalent provisions related to minerals.[722] This means that the MPRDA extends to a certain level of environmental protection, but the requirements do not regulate all of the designated permits and rights.[723] Therefore, it is not ideal that the exact legislative approach for the governance of minerals and petroleum be carbon-copied for the regulation of biofuel production.

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[714] Ibid at ch4, s37(2).
[715] Ibid at ch4, s39.
[716] See further: *Industrial Strategy*; and *Position Paper.*
[717] MPRDA ch7, s107.
[718] Ibid.
[719] Ibid.
[720] Ibid at ch7, s107(a)(i)-(viii).
[721] Ibid at ch4.
[722] Glazewski *Environmental Law* 497.
[723] Ibid at 498.

The existing biofuel policies need to be amended to integrate environmental management practices before excavation for production begins. Similar to the link between NEMA and the MPRDA,[724] biofuels policy could tie to the Environment Conservation Act[725] (ECA).

Although ECA has largely been replaced by NEMA, there are certain provisions that remain in force, specifically concerning limited development areas. ECA prohibits all actions that: transform a piece of land by any means; allow for resource renewal, energy generation or; distribution of chemical treatment.[726] ECA also then authorises delegates to grant exemption of such limitations in instances where they deem necessary.[727] Thus far ECA has not been referred to in protest of the proposed biofuels development in South Africa with respect to neither the *Industrial Strategy*, nor the *Position Paper*.

With reference to feedstock selection and the increased biodiversity concern globally, neglecting to consider the effects of mass production of an alien and invasive species could create an unnecessary web of concern in the future.[728] The fact that Jatropha is an exotic plant to South Africa limits the potential to explore its fermentable production value in biofuel processes.[729] Although unfortunate that a rewarding crop like Jatropha is now excluded from biofuel production in South Africa,[730] it is promising that newly developed policies now exhibit a level of engraved environmental awareness.[731]

A further addition to biofuel policy relates again to the MPRDA where it defines its environmental conscience at the outset.[732] It is often seen as a welcome and novel feature as it sets a precedent for which the law should

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[724] MPRDA ch4, s37.
[725] Environment Conservation Act (No. 73 of 1989) Republic of South Africa.
[726] Ibid at Part V.
[727] Ibid.
[728] This was reinforced by Arponen, referencing the CBD, in Arponen A "Prioritising Species for Conservation Planning" 2012 (21) *Biodiversity Conservation* 876.
[729] *Position Paper* 18.
[730] Ibid.
[731] Policy developments such as the *Position Paper*.
[732] MPRDA ch2, s2(h).

adhere to.[733] The current regime defined for biofuel regulation could benefit greatly from instilling an environmental objective at the outset.

This promotion of cooperative governance links directly to the role of institutions in defining the enforcement of environmental protection.[734] With the *Biodiversity Paper*, the significance of this aspect has been effectively registered in policies. The challenge now is to effectively translate the policy into legislation.

3.2.8. Institutions and governance

The term 'institutions' in this context encompasses both the industries and players involved in biofuel production mechanisms. It also refers to the relevant corporate and directorate bodies that manage organisation and implementation.

Although there are no complete industrial-scale biofuel plants in South Africa, there has been strong interest in the planning stages of production plants in the past few years.[735] The *Industrial Strategy* brought about positive movement for development.[736] It yielded the approval of substantial funding by South Africa's Industrial Development Corporation in conjunction with the Energy Development Corporation.[737] The funding was put towards initiating two bioethanol plants in South Africa that would be the pioneer biofuel developments.[738]

What has now been loosely termed as the 'biofuel revolution' has been used as an example when illustrating renewable energy schemes.[739] It

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[733] Glazewski *Environmental Law* 467.
[734] Gigot E "International Law and Biofuel Issue Related to Climate Change" 2013 LLM Thesis *International Environmental Law* University of Stockholm.
[735] Letete "Modelling" 32.
[736] Letete & von Blottnitz 2012 *BSDA* 194.
[737] Ibid.
[738] Ibid.
[739] Andersen P, Mathews J & Rask M "Integrating Private Transport into Renewable Energy Policy: The Strategy of Creating Intelligent Recharging Grids for Electric Vehicles" 2009 (37) *Energy Policy* 2485.

is also an excellent example of the obstacles their transitions face.[740] Acquiring institute involvement has proven to be troublesome.[741] This is even more prevalent when the reluctance of petrofuel companies is mostly exhibited from the developed Northern nations when expected to import biofuels from the developing nations of the South.[742] The North-South divide continues, which often results in detrimental results.[743] Hence, one of South Africa's driving goals towards the development of a biofuel industry is the need to build a link between the divided first and second economies within the nation itself.[744]

Along with acquiring involvement from major institutions and companies, local enrolment in the form of farmers' participation is important for the initiation of a scheme such as the biofuel process.[745] Years before the establishment of the *Industrial Strategy*, groups of farmers were the first to initiate the biofuel movement.[746] A group of farmers established themselves as stakeholders in a corporation aimed at unlocking the true value in maize, by converting it to ethanol.[747] The farmers' initiative was of significant stature when it secured funding for the construction of several plants across South Africa.[748] It was halted when the *Industrial Strategy* was released however, as maize was not included as a suitable targeted feedstock.[749] It also excluded the farmers' primary location from its scope.[750] The exclusions went even further, as many of the stakeholders involved were not technically viable.[751] According to the *Industrial Strategy* they were not 'previously disadvantaged communities'.[752] This failure further entrenches the need for

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[740] Ibid.
[741] Mathews 2007 *EP* 3551.
[742] Ibid.
[743] Ibid.
[744] Letete "Modelling" 2.
[745] Letete & von Blottnitz 2012 *BSDA* 195.
[746] Ibid.
[747] Ibid.
[748] *Industrial Strategy* 10. See further Letete & von Blottnitz 2012 *BSDA* 195.
[749] Ibid.
[750] Ibid.
[751] Ibid.
[752] Ibid.

numerous elements to be expanded on in the future biofuels framework. It also reveals that many additional elements should be added in order to create a fully regulated mechanism for cleaner energy. Through the Pipelines Act and its extension to NERSA, competent authorities and organising institutions can be governed.[753]

The explicit exclusions outlined in the *Industrial Strategy* undoubtedly contributed to its shortfall.[754] The *Industrial Strategy* targeted previously disadvantaged regions and their farmers.[755] However, studies revealed that most of those emerging farmers knew little to nothing about biofuels and its emergence.[756] Subsequently farmers have been extremely sceptical to implement biofuel policies into their farming methods due to their unfamiliarity.[757] These shortfalls have halted the establishment process for an agriculture-based biofuels development within South Africa.[758]

The *Position Paper* outlines the establishment of the Biofuels Implementation Committee by the Minister of Energy, how it is to be formed, and the methods chosen for enforcement.[759] The definition of the Biofuels Implementation Committee however, lacks structure and could easily become a lacklustre organisation with no real authority.

The MPRDA gives effect to the Minerals and Mining Development Board (Development Board).[760] The Development Board exists to advise the Minister on any and all matters regarding the sustainable development of the country's mineral resources.[761] The functions of it could easily be expanded to include the management of the Biofuels Implementation Committee.

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[753] Pipelines Act ch3.
[754] Letete "Modelling" 14.
[755] Letete & von Blottnitz 2012 *BSDA* 195.
[756] Ibid.
[757] Ibid.
[758] Ibid at 196.
[759] *Position Paper* 11.
[760] MPRDA ch5, s57-58.
[761] Ibid.

South Africa possesses a well-established conventional technology sector as well as mature and recognised production processes.[762] The further development of these technologies can be facilitated through the establishment of a domestic biofuels industry.[763] For this initial set-up, a quantified biofuels legal framework is required. For now however, institutions can be somewhat regulated under existing legislation governing varying sectors within South Africa. Branching together different sections of law under one policy is not uncommon.[764]

NERSA is an important regulatory body in terms of institutions. Established to regulate the pipelines, electricity and piped-gas industries, NERSA is afforded specific powers and duties as regulated by the Pipelines Act.[765] The authoritative powers include issuing licences for the construction of petroleum pipelines, as well as the conversion and operation.[766] NERSA is further designated to promote competition within the pipeline industry and to make novel decisions on the future regulation of the pipelines.[767] This element may well be the effective governance the future biofuel regime needs.

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[762] *Industrial Strategy* 17.
[763] Ibid.
[764] Glazewski *Environmental Law* 487.
[765] Pipelines Regulation s(A).
[766] Pipelines Act ch2(4)(a).
[767] Ibid at ch2(4)(i-j).

Chapter 4: Conclusion

South Africa has defined many capacity-related goals for different forms of renewable energy.[768] These goals focus on the share of electricity generation through wind energy, hydroelectricity, and solar power.[769] What is missing is a mechanism which dozens of international countries have been implementing for over a decade, the substitution of petrofuel with sustainable alternative fuels.[770] Biofuels need to fill the renewable energy niche that has been carved in the market.[771]

Most, if not all of the policies outlined in Chapter 2, called for the introduction of an inclusive support policy.[772] The *Industrial Strategy* was the result.[773] It formed one of two major stepping stones that South Africa has implemented in the move towards the generation of alternative fuel methods, the second being the *Position Paper*.[774]

Being the first document of its kind introduced in South Africa,[775] the *Industrial Strategy* is comprehensive in its elements. Its success amongst policymakers and the interest of investors brought about the *Position Paper*,[776] of which based on this analysis, is less than comprehensive. However, when cross-referencing the two documents, there are notable elements that provide for a promising future for the development of a legal biofuels regulatory tool.

A number of lessons can be derived from the *Industrial Strategy*. Through its shortfall the need for clarity throughout policy, with clear definitions and targets, is highlighted.[777]

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[768] *Legal Frameworks* 104.
[769] Ibid.
[770] *Industrial Strategy* 11.
[771] Letete & von Blottnitz 2012 *BSDA* 198.
[772] *Industrial Strategy* 11.
[773] Ibid.
[774] *Position Paper* 9.
[775] Ibid at 11.
[776] Ibid.
[777] Letete & von Blottnitz 2012 *BSDA* 198.

It has become clear that, during the global search for potential biomass to contribute to the renewable energy sector, the most promising regions lie in sub-Saharan Africa.[778] However, there is a prevailing no-win situation: efficient and cost-effective energy cannot be produced from any and all of the land, be it available or not.[779] The extent of land potential is limited by the chosen location, type of feedstock and production methods.[780] Deforestation and land use change are constant threats,[781] therefore having significant influences on the longevity of bioenergy systems.[782] It is crucial for policies to incorporate this into the scope, and to ensure the appropriate environmental and social impact assessments are put in place.

The issue of depleting non-renewable resources, and the exponential pace in which the human race is consuming them, is the original driver behind the world's search for clean energy.[783] It is imperative that an environmental objective be the primary aim embedded within any biofuel policy scheme.

There are numerous reforms policy-makers can take to allow the *Position Paper*, and subsequent legal frameworks, a chance at effective regulation.

Firstly, the lack of adequate guidelines for the implementation of infrastructure, development, and production requirements is prevalent in the *Position Paper.* The *Energy Paper* highlights the importance of instating fuel

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[778] Letete "Modelling" 30.
[779] Ibid.
[780] Ibid.
[781] Ibid.
[782] Ibid.
[783] There is an abundance of literature relevant to this statement, see further: Amigun, et al 2008 *RSER* 691; Andersen et al 2009 *EP* 2481; Ajanovic 2011 *Energy* 2070; Khumalo L "Sustainability Begets Unsustainability? The European Union's Drive for Agrofuel Crop Farming in Africa" 2011 (41) *Africa Insight* 66; and Paterson A "Biodiversity and Climate Change: Linkages at International, National and Local Levels" 2013 (16) *Potchefstroom Electronic Law Journal* 472.

standards and specifications.[784] It addresses the necessity as being compulsory should free trade in liquid fuels be introduced.[785]

The legal framework requires a working set of standards and guidelines for which to abide by. The future Blending Regulations, together with the Standards Regulations, could coordinate these guidelines in terms of both the PPA and Standards Act.[786] SANS specifications defined for blending of biodiesel and bioethanol could be extended to include a comprehensive set of working guidelines.[787] The National Norm could then provide a harmonisation of domestic and international standards.[788]

NERSA is the ideal mechanism through which to provide this regulation.[789] The NERSA Rules have been established to standardise licensing applications specific to pipelines.[790] As a regulatory body established through both the PPA and the NERA,[791] it is already prepped for the appropriate governance of standards.[792]

An additional provision in a working set of guidelines should outline the future management and re-address the schemes and their timelines. The accreditation could be awarded to the BTT in conjunction with the National Treasury to verify if any changes are needed. The BTT as the relevant competent authority[793] could be afforded enforcement powers. Management methods are required and could be included in a comprehensive set of guidelines as indicated above.

The underpinning legislation for the development of an effective framework for the governance of a renewable resource is the MPRDA. The MPRDA explicitly states the need for South Africa to become internationally

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[784] Glazewski *Environmental Law* 493.
[785] Ibid.
[786] Standards Act s2(3)(1).
[787] Ibid at s3(23).
[788] Ibid.
[789] "Legislation Overview".
[790] Ibid.
[791] Pipelines Regulation.
[792] "Legislation Overview".
[793] *Position Paper* 9.

competitive with efficient administrative measures and effective regulatory regimes.[794] It places an emphasis on sustainable development, and environmental protection is entrenched within its enforcement.[795]

The MPRDA is often dealt with in numerous sectors as it encompasses not only minerals and petroleum, but energy as well.[796] It has a specific chapter dedicated to "petroleum exploration and production".[797] Hence, it is referenced often when unpacking other sectors and their policies.

Together with the MPRDA, the PPA could easily be amended to give effect to a regulatory body that includes biofuel production regulation in its scope.[798] The MPRDA should in turn bind the regulatory bodies into enforcing environmental protection through EMPs and programmes.[799] The role of competent authorities is integral in the success of any legal framework.[800] Biofuel regulation happens to be of an environmentally sensitive nature and therefore the duties become more comprehensive.[801]

Secondly, stakeholders should be recruited in the initial developmental processes.[802] Projects that integrate public participation are much more likely to be tolerated.[803] This is true even with an element of uncertainty for renewable energy ventures.[804] For the development of a successful biofuels policy, detailed and integrated consultation processes should be coordinated with the target stakeholders.[805] It is even more prevalent when the targeted stakeholders are farmers isolated in rural locations, instead of larger industrialised institutions.[806] Under the Appropriation Act the engagement of

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[794] Ibid at Preamble.
[795] Glazewski *Environmental Law* 497.
[796] Ibid.
[797] MPRDA ch6, s69.
[798] PPA s2.
[799] MPRDA ch6.
[800] Amigun et al 2011 *RSER* 1366.
[801] Ibid.
[802] Amigun B, Musango J K & Brent A C "Community Perspectives on the Introduction of Biodiesel Production in the Eastern Cape Province of South Africa" 2011 (36) *Energy* 2507.
[803] Ibid.
[804] Ibid.
[805] *Biofuels Cost* 36.
[806] Letete & von Blottnitz 2012 *BSDA* 198.

all affected parties is mandated.[807] Biofuel policies that are being created now should incorporate this aspect into its consultation process.

Thirdly, the issue of mandatory blending should be clarified in all legal mandates that serve to regulate the production of biofuel. This is particularly apparent in a developing nation with such a vast and contrasting economic stature as South Africa.[808] Mandating a blend order across all petrofuel companies will allow for an equal division of opportunity and cost.[809] It will also serve to minimise the risk of dwindling the smaller localised manufacturers.[810] The mandating of blending can be introduced through the PPA Amendment Act.[811] This Act gives the Minister the power to authorise mandates by gaining quality control.[812]

The *Position Paper* addresses the topic of directing certain biofuel blends towards companies that physically transport the petrofuel blends.[813] This process utilises biofuels in the provision of blends to wholesalers and end consumers,[814] thereby eliminating the 'middle-man' of regular petrofuel and diesel.[815] Although the *Position Paper* address is brief,[816] it is nevertheless notable as a contributing factor to implementing mandatory blending. However, the note needs to be extended to legislation as well. Both the PPA and the MPRDA should enforce mandatory blending through extended regulations. This can be done through the Blending Regulations, for example.[817]

The power of regulations extended from overarching legislation should never be underestimated.[818] Layering within regulation provides sound

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[807] Appropriation Act s5(3).
[808] See further Fine & Rustomjee *Political Economy*.
[809] *Industrial Strategy* 19.
[810] Ibid.
[811] Ibid.
[812] Ibid; Letete & von Blottnitz 2012 *BSDA* 198.
[813] *Position Paper* 11.
[814] Ibid at 16.
[815] Ibid.
[816] Ibid.
[817] Blending Regulations.
[818] See further Dolowitz & Marsh 2000 *GIJPA* 24.

implementation.[819] Enforcement through the PPA and the MPRDA would illustrate the obligations to manufacturers and wholesalers.

A supplementary set of guidelines could be developed as an appendix to the Pipelines Act under the authority of NERSA, for the regulation of biofuel blends in pipelines.[820] This attachment could extend to the licencing and process of application for biofuel pipelines, much as the Pipelines Regulations do for regular petrofuels.[821]

Fourthly, and arguably one of the most important guidelines,[822] is the instating of institutional bodies into regulatory positions to ensure an effective legal framework. This issue has been addressed on numerous occasions in literature.[823] The involvement of private actors can be integral in the incorporation of relevant issues into the process of biofuel production.[824]

A combination framework incorporating numerous policy incentives as a core function of technology is a potential approach to the inclusion of a wider range of institutional bodies.[825] This style would result in gaining maximum potential from international practice, and as a result, yielding a much greater technological maturity.[826]

Lastly, it has been noted that policies have the potential to play an important role in leading socio-technical change.[827] For governments who wish to voice their stance on mitigating global warming, biofuels are in a

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[819] Rodrigo D, Allio L & Andres-Amo P "Multi-level Regulatory Governance: Policies, Institutions and Tools for Regulatory Quality and Policy Coherence" 2009 *OECD Working Papers on Public Governance* Working Paper 13.
[820] Pipelines Act.
[821] Pipelines Regulations.
[822] See further: Gibson J *The Ecological Approach to Visual Perception* 1979 Houghton Mifflin, Boston; Hallward P *Out of this World: Deleuze and the Philosophy of Creation* 2005 Verson, New York; DeLanda M *New Philosophy of Society – Assemblage Theory and Social Complexity* 2006 Continuum Press, London; and Humalisto N "The European Union and Assembling Biofuel Development – Topological Investigations Concerning the Associations between Law, Policy and Space" 2014 Thesis *Faculty of Mathematics and Natural Sciences, Department of Geography and Geology* University of Turku 21.
[823] Ibid.
[824] Gigot "International Law".
[825] Amigun et al 2011 *RSER* 1361.
[826] Ibid.
[827] Charles et al 2007 *EP* 5744.

politically attractive position.[828] Keeping hold of the environmental objective is a crucial aspect for the future development of biofuel frameworks. An environmental implementation directly into policies would benefit the longevity of biofuel production. Instating the mandatory practice of Environmental Impact Assessments (EIAs) and Environmental Control Officers (ECOs) may contribute to biofuels regulation being accepted as a legitimate developmental body to enhance the current state of living. These roles are extended from implementing EMPs into biofuel production proposals.

The role of EIAs and ECOs should be effectively incorporated to dictate all courses of action on site. These principles could be introduced to biofuels policy through ECA.[829] Similar to the MPRDA in defining its environmental mandate at its outset,[830] biofuels policy needs to do the same.

The instilling of an environmental conscience in the MPRDA has resulted in the Act being viewed as a novel entity.[831] The future regulatory biofuel regime requires a similar attitude for it be seriously considered by producers when implementing practices. The MPRDA highlights the important objective for South Africa and its legislative enforcements to uphold its international obligations.[832] Further entrenched in the Act is a commitment to sourcing new resource material.[833] Annexing biofuel sources under this provision would be an effective measure towards a future legal biofuels framework.

With the main recommendations discussed above, a number of elements should be amended in the existing biofuels regime to make it effective.

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[828] Ibid.
[829] ECA s2.
[830] MPRDA Preamble.
[831] Glazewski *Environmental Law* 467.
[832] Ibid at 499; MPRDA ch3;
[833] MPRDA ch4.

The future biofuels legal regime needs to incorporate special clauses into its framework. A special clause would state that the biofuels policy to become mandated shall not be viewed as a detrimental entity towards any projects that have already been established. This would need to include projects with the aim of implementing clean development mechanisms and reducing greenhouse gas emissions.[834]

While scoping and digesting these regulatory frameworks and the laws that govern them, the objective to reduce the globe's footprint on burning fossil fuels is clear. Having stated this, many of the instrumental players do not possess the environmental conscience of others. Therefore the elements identified in this dissertation may be interpreted as just that, elements. The fundamentals are therefore not being utilised as per their intended direction to create a renewable state of living.[835]

In the Constitution of the Republic of South Africa,[836] an environmental right is defined.[837] Most notable in the current biofuels regime is the minimal attention environmental law is accredited, and subsequently the environmental right. The initial intention of developing biofuel strategies and implementation programmes was to source an alternative form of energy to alleviate environmental strains. However, that appears to be where the concern has remained.

For biofuels regulation to truly become instrumental in the governance of its production in South Africa, implemented policies will need to move towards translation into law. Translating biofuels policy into legislation at a later stage would result in hard law being established for its governance. For example, if South were to evolve the *Position Paper* into an established law, it would be hugely beneficial as it would be the overarching legislation for

[834] Nasterlack et al 2014 (23) *ESD* 1.
[835] Amigun et al 2008 *RSER* 691.
[836] Constitution of the Republic of South Africa (No. 108 of 1996) Republic of South Africa.
[837] Ibid at s24.

biofuel production. There would be no question as to whether it was enforceable as is the problem so often with policies and guidelines.

As a critical comparative review, this dissertation serves to provide a concise critique of the South African future biofuels framework. Specifically the review focuses on the *Position Paper*, and draws from the *Industrial Strategy*. Chapter 2 and Chapter 3 have respectively summarised: the supporting structure of the policy framework for the implementation of a biofuels regulatory regime; and critiqued the key elements identified to form an effective governing regime specific to biofuel production, through the application of existing legislation.

The research objective of whether South Africa possesses the necessary framework to go ahead with the implementation of biofuel production has been proven false. Currently the legal regime outlined for biofuel production is not sufficient to warrant the venture to be continued along the existing guidelines.

As there has been a decided niche carved for renewable energy policy,[838] the *Position Paper* attempts to step into the role. There are many challenges apparent in the future biofuels policy framework. Nonetheless, the development of such biofuel production strategies allows for the country to explore the range of alternative energy technologies.[839] Biofuels are a necessary stepping stone and if not dealt with in the correct manner, may close the opportunity for further technologies to be developed in the likes of hydropower, geothermal energy, and biomass options. Currently however, the *Position Paper* does not adequately fill the niche for a biofuels implementation strategy in South Africa.

The proposed South African biofuels framework is admittedly juvenile and subsequently craves definition and clarity. This refinement will allow for it to qualify from a regulated and required policy into a structured legal

[838] Amigun et al 2008 *RSER* 691.
[839] Alvarez 2009 *LR* 147.

framework, and eventually law. However, the elements discussed in Chapter 3 have highlighted a few qualities that have not presented themselves previously. Elements such as the consideration of cost on transport of the blended fuels and the location of blending itself are notable to mention.[840] Transport is a serious issue that governments and policy-makers face today.[841] These elements often form key components of regulation policies as it inadvertently affects how the policies are applied in practice.[842]

What biofuel development requires specifically in developing nations is credibility as an alternative fuel.[843] Recently biofuels and all the developmental criteria that befall them, including feedstocks and products, have been viewed sceptically.[844] Biofuels represent the unknown in an environment where the known has been exhausted.

South Africa is moving in a direction towards mandating functional operation.[845] This would significantly contribute to its growth as a developing nation in the economic sector.[846] Government has done well with defining long-term targets based on renewable energy generation and the country's capacity to do so.[847] This, accompanied by the numerous short-term goals that have been outlined as stepping stones towards bigger objectives, have contributed to the greater outlook of achieving optimum sustainability.[848] Overall the strategic papers and policies that South Africa has implemented have greatly enhanced the promotion of renewable energy generation in the country.[849] These policies should be more intricately integrated with the biofuels legal regime going forward.

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[840] Refer 3.2.2. at 42.
[841] Andersen et al 2009 *EP* 2485.
[842] Ibid.
[843] Alvarez 2009 *LR* 147.
[844] Letete & von Blottnitz 2012 *BSDA* 195. Refer 3.2.8. at 75.
[845] *Legal Frameworks* 104.
[846] Ibid.
[847] Ibid.
[848] Ibid.
[849] Ibid.

The lack of effective implementing instruments still sits as the front-runner for the country's shortfall of all target achievements to date.[850] The shifts in policies as well as lack of long-term experience dealing with new technologies contribute to this shortfall as well.[851]

Lastly, let me focus on this anecdote, described by Humalisto as: "the event of a cause is always more than just the cause" (2014).[852] This remark resounds with the notion that all occurrences are as a result of an intricate series of factors, which ultimately results in an outcome.[853] Policy instruments have the potential to increase the production and development of an entity,[854] and for the purpose of this dissertation, for the regulation of biofuel production. Therefore, for a process to become successful purely by its design there needs to be an actor acting with flexible decisions and adaptable production patterns.[855] Humalisto goes further to define the actor as possessing: "capacities to affect and to be affected".[856] There is philosophy entrenched within direction and governance.[857] It is evident by statements such as the above.

Studies such as these further acknowledge the dependence of policies and frameworks on responsible authorities.[858] The appointment of stable authorities for the development of implementation can lengthen the lifespan of developmental projects. This is especially true with sensitive issues like biofuel production. A heading such as 'institutions' within a legal biofuels critique might go overlooked when viewed amongst 'mandatory blending', 'incentives', or 'pricing', however the role of institutions and developing bodies are instrumental in the success of a legal framework.[859] It is more

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[850] Ibid.
[851] Ibid.
[852] Humalisto "Biofuel Development" 21.
[853] Ibid.
[854] Ibid at 22.
[855] Ibid.
[856] Ibid. See further DeLanda *Philosophy of Society*.
[857] Ibid.
[858] See further: Gibson *Ecological Approach*; Hallward *Philosophy of Creation*; DeLanda *Philosophy of Society*; and Humalisto "Biofuel Development".
[859] Ibid.

prevalent in a framework that requires hands-on involvement in the initial developmental stages of a relatively novel concept.

To polish this comparison, the South African policy for the legal regulation of biofuel production requires a well-layered framework for the definition of committees and corporate bodies that fulfil authority roles. Without a working set of standards,[860] any form of regulation will flounder and fall short of the prescribed objective.[861]

Currently the regulatory framework proposed for the future implementation of biofuel production in South Africa is not efficient to translate as an effective tool for its establishment into law. The future legal regime requires definitive guidelines to be developed so as to fall in line with existing legislation.

[860] Glazewski *Environmental Law* 493.
[861] "Legislation Overview".

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