

**The GreenCape Sector Development Agency Progress
Report on Strategic Project**

BIOFUELS IN THE WESTERN CAPE

2013-2014



**Report Prepared for:
Trade and Sector Development
Department of Economic Development and Tourism
Western Cape Government**

greencape

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EXECUTIVE SUMMARY

Background

The Biofuels Programme in 2013-2014 consisted of two separate projects

1. Developing a business case for sustainable biofuels in South Africa: a focus on waste-based bioethanol for fleet transport in the Western Cape
2. Biofuels: From Viability to Pilot Projects

This report summarises the work done under these two projects during the 2013-2014 year and outlines the programme of work for the 2014-15 year for the Green Economy-funded project Biofuels: From Viability to Pilot Projects.

1. Developing a business case for sustainable biofuels in South Africa

This study, funded by the Swedish International Development Agency, under their business partnership programme, investigated the potential for the use of sustainable biofuels in South Africa – with a focus on waste-based bioethanol for fleet transport in the Western Cape. The partners in the project were Scania, the Western Cape Government and the City of Cape Town.

Goals and Deliverables:

The following key questions were addressed by this study:

- What is the business case for biofuels from waste in the Western Cape region, and sustainable bioethanol for heavy duty transport in other parts of South Africa?
- What is the market size for fleet transport, which vehicles are suitable for this type of biofuel/ethanol operation, and what is the fuel demand?
- Which regulatory framework/policies are in place, locally and nationally, and which need to be further developed for a successful introduction of biofuels? It is especially important to clarify how a fuel standard for ethanol for heavy duty compression ignition engines, similar to Scania's technology, could be introduced in South Africa.
- What is the potential net benefit of a biofuels roll-out in terms of carbon footprint reduction, and what local poverty alleviation and employment opportunities could arise?
- Which are the most promising business cases in South Africa and in the Western Cape specifically, and which are the suggested initial demonstration fleets?

The major deliverable was a final report, which included recommendations on the way forward, and the potential sources of funding available for this.

Results of the study

The short term nature and limited funding of this project restricted the level of analysis able to be undertaken to answer critical questions around the regional biofuels opportunity. It was however able to establish the following:

- The current national biofuels policy is directed primarily at supporting rural development and job creation amongst emergent farmers; and is focused on blending bio-ethanol and biodiesel into the fuel pool at 2% and 5% respectively
- Eligible biofuel producers will be guaranteed a 15% return on their assets (ROA) through subsidisation. Subsidies will only be paid to producers if they source at least 10% of their feedstock from emergent farmers using previously underutilised land.
- The national biofuels policy is focused on primary agriculture, and makes no provision for waste-derived biofuels production, nor for any sub-national (e.g. Western Cape) niche opportunities
- That, under the current policy directive, second generation ethanol production (i.e. waste as feedstock) will only be considered for licensing for research purposes.
- There remain major uncertainties around the national biofuels programme. Whilst a mandatory blending date has been set as 1st October 2015, there is still no clarity on pricing mechanisms or subsidies, nor on the criteria that will be applied to grant them.
- Equally challenging is the fact that the policy prescribes that all biofuel projects be new investments, thus locking out existing production from commercial farms. A stated preference for “emergent farmers” and “co-operative” sales modes requires much more rigorous analysis. This should be an explicit objective of future research.
- Analysis of the business case for biofuels production in the Western Cape merits re-examination, as work undertaken by WCG’s Department of Agriculture in the mid 2000s pre-dated the National Biofuels Industrial Strategy, and focused on primary agriculture. Under the current policy proposals, an ethanol plant of 100 million litres/annum capacity could attract in excess of R200 million per year in subsidy to the province. For this reason alone, the business case should be re-examined.
- It will be important to consider all waste resources as potential feedstocks (including agricultural residues); understand the potential of non-food crops; as well as implications for land use and management; and to compare/contrast the business opportunities related to biofuels for blending versus biofuels as dedicated fuels.

- Looking beyond blending of biofuels into the current liquid fuel pool, there is a need to better understand the Western Cape demand picture, including the ability to use biofuels for dedicated transport fleets (buses, freight, tractors etc.) operating in closed loop systems.

Concluding Remarks

The project identified fruit processing waste streams as suitable feedstocks for small scale (\pm 1 million litres/year) ethanol production. A pilot project at Namaqua Wines on the West Coast, using grape skins as the feedstock was identified, for which funding is being sought from among others the UN's Sustainable Energy for All's High Impact Opportunities Bioenergy Programme, Swedfund, TIA and the dti. It is envisaged that the fuel produced will be used to fuel a yet to be identified pilot fleet of approximately ten City of Cape Town vehicles, using Scania's proprietary compression ignition ED95 technology.

A study of the carbon footprint of the fuel produced by this proposed production facility concluded that it would have emissions of less than 18% of those from diesel. This demonstrates the advantages of using waste streams as the feedstock for biofuel production.

2. Biofuels: From Viability to Pilot Projects

Given the findings of the above project, GreenCape is extending this initial work, in the context of the Green Economy. This project aims to assist the Western Cape Government in its engagement with National Government vis-à-vis the National Biofuels Industrial Strategy, and to further stimulate and develop opportunities in the biofuels sector in the Province. A budget of R1,2 million has been approved up until March 2015.

Project Goals

The broader goals of the project, over and above the hard deliverables are:

- To confirm the general viability, and develop the niche business opportunity provided by biofuels from wastes and non-food crops in the Western Cape; and in so doing, help establish an expanded and diversified agriculture and agro-processing sector, thereby contributing to the Western Cape's Green Economy Strategic Framework
- To contribute to a reduction in the Western Cape's carbon footprint
- To contribute to regional energy security

The actual deliverables from this project will be:

- A detailed techno-economic re-assessment of the biofuels potential for the Western Cape, using both wastes and non-food crops as feedstocks, including an investigation of suitable crops, and their potential for integration into existing conservation agriculture and crop rotation systems.
- Identification of business cases for further development.

Project Outputs for 2013-2014

In the first phase to the end of March 2014, a comprehensive report on the status quo with regard to biofuel production and potential in the Western Cape will be completed. In addition, the scope of work for studies to be conducted in subsequent phases will be formulated, appropriate service providers identified and contracted, and the Steering Committee constituted.

Project Development in 2014-2015

The project will evaluate biofuel production routes, and identify the preferred options through use of multi-criteria decision making tools. This modelling will incorporate local production capacity, market demands, economic viability, socio-economic benefits (incl. expansion of agriculture and job creation) and environmental benefits (carbon footprint reduction).

Concluding Remarks

The Western Cape agricultural sector is in need of diversification opportunities that could help secure its long-term sustainability. Biofuels production is potentially one such opportunity, which can also provide opportunities for the entrance of emerging farmers into a well-defined and secure local market, relatively insulated from the vagaries of international commodity markets. The development of the sector would thus contribute to the creation of stable and sustainable green jobs, and potentially also help address the severe social inclusivity issues affecting the agricultural sector in the province.