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Biofuels in Southern Africa

Political economy, trade, and policy environment

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Abstract: Expansion of biofuels production and consumption at the regional and national levels relies on both supportive energy prices and policy interventions. Despite enthusiasm for policy interventions to stimulate biofuel production in Southern African countries in the mid-2000s, the years since have seen a decline in interest due to concerns over environmental and social externalities, and the costs associated with subsidies. This paper reviews the state of the policy, regulation, and narratives around opportunities and challenges for biofuels in each country to assess broader challenges associated with expanding biofuels production and consumption at a regional level.

Keywords: biofuels, Southern Africa, policy, Zambia, Mozambique, South Africa

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1 Introduction

There has been a long-standing interest in leveraging the perceived abundant land resources in Southern African countries to produce feedstocks for biofuels. From a national economic perspective, proponents have argued that domestic production can reduce the dependence on the imports of fossil fuels for the transport sector, which saddle oil importers with high bills during periods of high oil prices. Producing fuel domestically could lessen exposure to external oil price shocks, removing the threat of fuel shortages and pressure to subsidize fuel, which could help stabilize government spending during periods of crisis. These economic arguments have underpinned decisions by several governments (e.g., Malawi, Zimbabwe) to develop biofuels.

In recent years, attention to decarbonizing energy as part of efforts to combat climate change has lent further impetus to developing biofuel sectors. Given early optimistic expectations surrounding the potential of low- or zero-carbon biofuels, it was hoped that biofuel sector development could both help decarbonize home countries' transport energy sectors, and also enable them to take advantage of various streams of low-cost development and climate finance to expand their energy sectors. Under ambitious scenarios of straightforward and preferential access to European Union (EU) markets, firms, and governments have also contemplated biofuel exports generating foreign currency earnings.

Finally, biofuel feedstock development has been proposed as a means of contributing towards rural development and poverty reduction. Since the production of feedstocks requires investment in infrastructure, creates jobs, and brings more actors into value chains, its promise as an additional source of investment was welcomed by governments and development partners who recognized the importance of agricultural transformation and expanding rural markets to broader economic development and poverty reduction.

In the context of Southern Africa, where a large proportion of the population continues to be employed in the rural sector, where economic growth has stagnated and where fuel and broader energy demand is expected to grow continuously in coming years, the attraction of biofuels was particularly high.

1.1 Biofuels and policy

Biofuels are a complementary and alternative energy source to fossil fuels and have the potential to generate energy from (SABA n.d.):

- forestry, timber, wood, and waste streams;
- bioethanol to replace petrol;
- biodiesel;
- gas produced from renewable sources and waste; and
- hydrogen and other energy carriers, produced from renewable sources.

It is important to note that biofuels demand has been largely spurred by the transport sector and more especially by road vehicles, which use biofuels either in pure form or blended into conventional fossil fuels. More recently, recognition of the need to decarbonize other transport sectors, including aviation and maritime transport, has led to these sectors carrying out small- to medium-scale initiatives to source and blend biofuels. However, development in materials science and manufacturing has also spurred alternative markets for biodiesel and bioethanol, and has led some countries such as South Africa to shift their policy focus away from one limited to liquid

transport fuel to broader notions of bioenergy (solid, liquid, and gaseous energy products) and the bio-economy.¹

The enthusiasm for biofuels production led to a spate of new legislative and regulatory frameworks in several countries that sought to expand production and consumption of biofuels, including the countries discussed in this paper. Since biofuels are generally more expensive to produce and consume than fossil fuels, stimulating the development of the market requires government intervention, such as subsidies and mandatory use of biofuels. Table 1 highlights some of the policy tools used to introduce bioethanol to the market at the national level.

Table 1: Policy tools often used to introduce bioethanol within a national context

| Supply-side policies | Demand-side policies |
|-----------------------------|-------------------------------------------|
| Direct production subsidies | Blend mandate (E02–E25) |
| Tax breaks | Ethanol pumps in tank stations (E85–E100) |
| Low-cost financing | Information campaigns |
| Training/capacity-building | Public tendering |
| Industrial/R&D support | Tax breaks |
| Subsidized ethanol stocks | Multiple counting towards mandates |
| Loan guarantees | Carbon tax |
| Trade tariff regimes | Fuel standards |

Source: authors' compilation based on UNCTAD (2013: table 6).

In the region, a number of countries developed part of the policy framework to incentivize biofuels demand, including mandates that require distributors to add fuel ethanol to gasoline (Table 2). In the case of Malawi, an ethanol blending mandate has existed since 1982, whereas in most other countries they have been introduced more recently.

Table 2: The state of biofuel mandates in selected Southern African countries

| Country | Existing target and status |
|--------------|------------------------------------------------------------------------------------|
| Malawi | Mandate for E10 exists and met since 1982. |
| Mozambique | Mandate for E10 exists since 2012 but not enforced. |
| South Africa | Mandate for between E2 and E10 into force from October 2015 but not enforced. |
| Zambia | Target for E10 planned but not entered into force. |
| Zimbabwe | Mandate for E10 exists (enforced since October 2013), planned targets for E15/E20. |

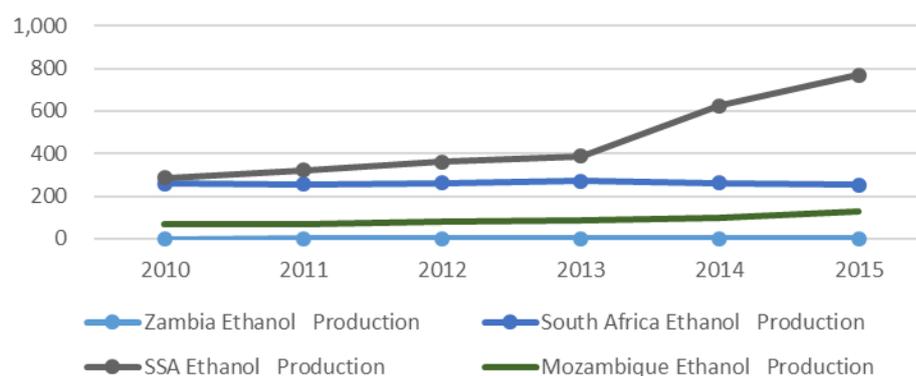
Information correct as of July 2017.

Source: authors' compilation

However, the legislative developments to date have been insufficient to spur development of production and consumption, as projected would happen a decade ago. Production in Southern African countries of interest (South Africa, Zambia, and Mozambique) has remained marginal (see Figure 1)

¹ A bio-economy—i.e. a bio-based economy—considers using biomass not only for energy, but also adds food, feed, and fibre as outputs (UNCTAD 2014).

Figure 1: Ethanol production and consumption in Southern Africa (2010–15) (million litres)



Source: authors' compilation using data from OECD and FAO (2016).

Reasons for this include factors related to developments in global energy and commodity markets in general and biofuel markets in particular, and in domestic experiences of attempting to implement land-intensive feedstocks. These are discussed below.

2 Objective and methodology

2.1 Objective

The objective of this paper is to examine recent trends in biofuels and linked global markets and political economy factors in the Southern Africa region, to understand incentives and constraints to expanding biofuel markets. In the analysis we also look at the current policies and laws on trade, and national regulatory frameworks with the aim of:

- 1 identifying key factors in the policy environment that impact upon production, consumption, and trade in biofuels in the (South African Development Community) SADC region; and
- 2 profiling the landscape for trade in processed biofuels and raw feedstocks among the countries of interest: South Africa, Mozambique, and Zambia.

Since the optimistic expectations of the mid-2000s failed to materialize, we look to understand what are the factors that have constrained production and what scope exists to overcome these.

2.2 Methodology

The analysis relies entirely on desktop research and considers the relevant commitments countries have made to both international agreements and in their domestic policies, and discusses how these impact the future of the biofuels sector. The products of interest include liquid biofuels ethanol and biodiesel, and their common feedstocks.

The rest of the paper is structured as follows. We start by reviewing recent global trends in biofuels that exert an important influence on the potential for domestic development of biofuels in Southern Africa. We then focus on the domestic policies and regulatory environments that impact on biofuels. Trade issues are discussed next, highlighting how the agreements that countries are party to influence trade in both biofuel feedstocks and their derivative processed products. Here we also look at whether scope exists to further trade in biofuels (in particular, exports from Mozambique and Zambia to South Africa) through a regional integration agenda. A discussion on

non-tariff barriers (NTBs) is also included, bearing in mind that these are a common concern in Southern Africa. The paper ends with a conclusion that outlines how the issue of biofuels in Southern Africa may be shaped in the future.

3 Global overview

Conditions in global energy markets and policies towards renewable energy and biofuels in particular in potential destinations strongly influence prospects for development of biofuels in Southern Africa. While trends in oil prices determine the overall economic rationale for replacing fossil fuels with biofuels in all countries (producers and consumers), much of both the public and private interest and investment into developing biofuels in Southern Africa in the late 2000s was driven by expectations that it would be possible and profitable to export biofuels to the EU, which offered large markets and favourable access for selected countries (Charles et al. 2009).

3.1 Trends in global biofuel policy and markets

Over the last 15 years, biofuels production has expanded rapidly globally, with most growth concentrated in the three largest markets (the United States (US), EU, and Brazil) and in the period up until 2011, after which growth slowed but international trade increased (Beckman 2015).

The early 2000s saw major economies introduce policies and legislation that would expand demand for biofuel production and consumption. In the US, the 2007 Energy Independence and Security Act and Renewable Fuel Standard set out a pathway to ramp up consumption of biofuels to 36 billion gallons by 2022 (equivalent to tripling the 11 billion gallons consumed in 2009), with sub-targets for different categories of fuel—most of the increase was to come from advanced (21 billion gallons) and cellulosic (16 billion gallons) biofuels.

In Europe, the Fuel Quality Standard and the EU's Renewable Energy Directive (RED) were the main instruments that set a course to ramp up biofuel consumption from 15 billion litres in 2009 to around 45 billion litres in 2020. The RED required that 10 per cent of Member States' total transport fuel should come from biofuels.

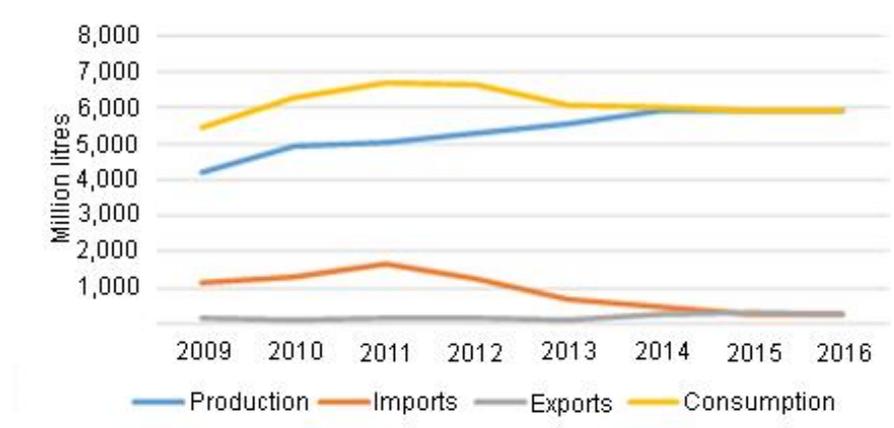
Meeting EU mandates required imports to complement production from Member States. While the expectation in the early 2000s was that the major exporters—Brazil, the US, and Argentina—would be the main suppliers to the EU, rulings in 2011 to impose anti-dumping and countervailing duties on imports from these countries opened up the prospect of importing biofuels from sub-Saharan African countries, which alongside other developing established producers² enjoyed preferential treatment.

However, growing concern over sustainability of biofuels produced outside the EU led to further reforms that raised barriers to access for EU markets. Responding to concerns regarding the impact of biofuels production on land use change and food security, in 2015 the European Parliament passed legislation introducing a cap at 7 per cent of the volume of transport fuels that could come from food or feed crops in 2020. Together with a requirement for all biofuels to be certified, this limited the profitability for third countries exporting biofuels to the EU.

² The EU trade agreements with Guatemala, Pakistan, and Peru included provisions to import ethanol (Beckman 2015).

At the same time, lower prices for agricultural commodities that contribute to biofuel feedstocks made it profitable for EU producers to increase production of biofuels. Together, these factors led to closing the gap between EU supply and demand (see Figure 2). In 2014, the EU was 99 per cent self-sufficient in bioethanol and 97 per cent self-sufficient in biodiesel.

Figure 2: Supply and demand for bioethanol in the EU (2006–16; million litres)



Source: authors' compilation based on data in USDA (2015).

3.2 Future prospects

European Union

Under present conditions, it is unlikely that the EU will hit the 7 per cent cap for food-based biofuels before 2020 (USDA 2015). It is unclear if all EU Member States will meet the mandated volume of 10 per cent of fuel use, as some are on track while others, such as the United Kingdom, are behind schedule.³ A 2015 EU progress report stated that achieving the advanced targets is challenging but achievable. At present, it is unclear what policy prescriptions will be mandated in the EU beyond 2020. An official EU Communication in 2014 stated that the Commission does not consider it appropriate to establish new targets for renewable energy or the greenhouse gas intensity of fuels used in the transport sector or any other subsector after 2020, and that biofuels from food-based feedstocks will not receive public support after 2020 (European Commission 2014).

4 Peak US ethanol consumption and potential growth in US ethanol exports

Production of US ethanol has grown year-on-year, and the US is the world's top producer, accounting for 49 per cent of all production. However, having already reached the maximum mandated levels for ethanol consumption, domestic consumption is not expected to grow substantially, although trade is expected to increase moderately. Major factors driving the expansion of trade are the saturation of the US ethanol market and especially the US specification for advanced biofuels under renewable mandates (OECD and FAO 2016).

³ The United Kingdom's decision to exit the EU puts into further doubt the likelihood that it will seek to import additional biofuels in order to meet the 10 per cent target.

US ethanol market saturation was the result of production ‘hitting the blending wall’; due to engine specifications and manufacturers’ terms that prevented consumption of fuel with more than 10 per cent of ethanol (E10), the total volume of ethanol blended with all US gasoline remains limited to 10 per cent. At present, over 95 per cent of all fuel consumed in gasoline engines is E10 (Energy Information Administration 2016). Although data on consumption of higher blends (E15, E85) are difficult to gather, estimates for 2016 suggest their consumption comprised 0.4 per cent of total fuel used in gasoline engines. Further consumption of these blends is limited because they can only be consumed in cars produced after 2007 (for E15) or in flex-fuel cars (for E85).

US consumption of renewable transport fuel is not expected to meet the legislated targets of 36 billion gallons by 2022. This shortfall is due to the lack of progress in meeting targets for advanced biofuels, including cellulosic biofuels. In 2015, US production of liquid cellulosic fuel amounted to 2.6 million ethanol-equivalent gallons, which corresponds to less than 0.1 per cent of the legislated target for that year. A major shift since the mid-2000s is the downward revision of targets for advanced biofuels. Very low volumes of advanced biofuels are expected to come on-stream by 2025, and it is expected that the US will miss the target set in the Renewable Fuel Standard (RFS) (OECD and FAO 2016).

Box 1: Will African producers have to compete with US and Brazilian exports?

The combination of cheap and plentiful feedstock of US corn coupled with a fixed domestic demand imposed by the blend wall and cheap gasoline has turned the US into a major exporter of ethanol. Exports for 2016—a year characterized by a bumper corn harvest and cheap oil—are expected to be 885.3 million gallons, the highest level in six years. Major destination markets include some countries that have policy-induced demand for ethanol, which they are unable to meet through domestic production, including Canada and Brazil.

It is therefore highly plausible that in the future a set of market conditions similar to those that presently exist would raise prospects of South Africa importing ethanol from the US, or possibly Brazil if prices are attractive. Domestic or regional trade measures would therefore be necessary to protect an infant Southern African industry and make it competitive.

Sources: <http://ethanolrfa.org/2016/09/ethanol-and-ddgs-exports-jump-in-july>;
www.eia.gov/dnav/pet/PET_MOVE_EXPC_A_EPOOXE_EEX_MBBL_A.htm;
http://trade.gov/topmarkets/pdf/Renewable_Fuels_Fuel_Ethanol.pdf.

5 Trends in oil and sugar markets

If oil prices rise to high enough levels, it will be profitable to produce biofuels irrespective of prevailing policies (Wiggins et al. 2011). During the period of high interest in biofuels, high oil prices meant that it would be profitable to sell any biofuels produced onto global markets, even if domestic mandates were not in place in the countries of production.

The combination of slow growth that has lowered overall levels of fuel demand and low oil prices have undermined demand for biofuels globally. The year 2015 saw a continued fall in nominal prices of ethanol and biodiesel owing to low prices of crude oil and biofuel feedstocks.

In the US, lower oil prices in 2015–16 further troubled the industry, with many firms being unable to cover running costs, let alone recover original investments. The fall in global oil prices between June 2014 (US\$115/barrel) and January 2015 (US\$50/barrel) likely lowered prospects of higher US exports in the medium to long term, as ethanol plants did not expand capacity (Beckman 2015).

While the energy-intensive nature of grain production in many markets means that lower oil prices have lowered the cost of producing biofuels, with oil prices at below US\$50/barrel, it is still more expensive to purchase than gasoline on an energy-equivalent basis. The Organisation for Economic Co-operation and Development's (OECD) medium-term estimates for oil prices indicate low prices continuing into 2017 (at below US\$50/barrel), suggesting this situation will not change soon.

Trends in global sugar markets add an imperative to diversify sugarcane production.

While the duty-free, quota-free access to Southern African countries (excluding South Africa) has provided a growing opportunity for exports and income for exporters, these are projected to decline as the EU sugar regime reforms and these countries lose access. A 2016 report by the European Commission suggests that sugar exports from African, Caribbean, and the Pacific Group of States (ACP) to the EU fell by 22 per cent between 2013 and 2015. This resulted in part from the cutting of the reference price by 36 per cent from US\$524/tonne to US\$335/tonne. This is in line with an earlier report (European Commission 2013) suggesting that European imports from ACP countries would half by 2023.

National and regional markets will pick up some of this slack, and governments have raised domestic reference prices, lowered taxes and raised trade barriers in order to insulate the domestic sugar industry (Dubb et al. 2016).

6 Overseas development support: current and future prospects for export markets—waning interest (and support) from the EU

As discussed above, changes in both the domestic policies of countries that dictate global biofuel expansion and in oil and commodity markets have dampened enthusiasm for biofuel production in Southern Africa. Changes to European legislation have effectively closed out opportunities to import biofuels from third countries. Coupled with lobbying from non-governmental organizations, this has disincentivized investors from pursuing biofuels projects.

In the early 2000s, the European Commission was keen to promote biofuels for mutual benefit, as demonstrated by their early inclusion in the 2008 EU Africa Energy Partnerships, which foresaw economic cooperation to develop Africa's energy infrastructure and help the EU meet its renewable energy targets (Charles et al. 2009). However, the ongoing challenges in getting biofuels projects 'off the ground', coupled with the accusations of land grabbing, effectively limited support for biofuels development from EU regional mechanisms and Member States. The main funding mechanism for EU support to the renewable energy sector—the Africa EU Renewable Energy Cooperation Programme (RECP)—explicitly excludes support to biofuels projects in its eligibility criteria (RCEP n.d.). Similarly, the US-led funding instrument for innovation in renewable energy in Africa—Powering Agriculture: Energy Grand Challenge—does not include among its awardees projects pursuing first-generation biofuel projects (Powering Agriculture n.d.).

7 Country analysis: domestic policy and regulatory environment

This section discusses the policy and regulatory environment, as well as some of the main policy priorities in the energy, rural, and agricultural sectors. The aim here is to provide a picture that will help to clarify the key issues facing potential domestic production in Mozambique and Zambia, and stimulate consumption and imports in South Africa. This section discusses for each country

- (1) the main policies and legislation in the energy and rural sectors that have a bearing on biofuels;
- (2) the political economy issues that help to explain a lack of progress in completing biofuels regulation or hinder implementation.

7.1 Zambia

Like elsewhere in Southern Africa, the early 2000s saw major investments in biofuels. Commercial biofuels production in Zambia started in the early 2000s with six major firms engaging in production (D1 Oils, ETC Bioenergy, Marli Investments, Oval Biofuels, Kansanshi Mines, and Southern Biopower) (Chu 2013). The emphasis of this early investment was *Jatropha*, and companies experimented with different production models, planting both large areas and working through outgrowers (German et al. 2011).

Policy on biofuels

This interest in commercial production spurred the creation of policy, institutional, and legislative frameworks. In 2008, the Zambian government issued the National Energy Policy and created national standards for biofuels. Blending ratios followed in 2011 (5 per cent for biodiesel and 10 per cent for bioethanol), as shown in Table 3.

Table 3: Key dates in the development of Zambia's biofuels industry

| Activity | Time |
|-----------------------------------------------------------------------------------------------|-----------------|
| Biofuels association set up | 2006 |
| Commercial production commences | 2006 |
| Biofuels standards developed (ZS E100 and ZS B100 for bioethanol and biodiesel, respectively) | 2006/07 |
| Biofuels included in the National Energy Policy | 2007/08 |
| Draft guidelines for storage, transportation, and retailing | 2008 |
| Statutory Instrument No. 42 recognizes biofuels as part of the energy mix | 2010 |
| Blending ratios are established | 2011 |
| Tenders to supply biofuels advertised, six firms bid, and three are allocated | 2014 |
| Biofuels pricing mechanism established | 2014 |
| Resumption of large-scale investments in commercial liquid biofuels | 2014 to present |

Sources: ERB 2008; Kunda 2014; Sinkala et al. 2013.

However, these steps did not lead to the expansion of the industry and several of the earlier investors exited the sector. Important reasons for this include the global financial crisis that constrained access to capital and the failure to reach projected levels of supply due to crops underperforming compared to expectations, and difficulty accessing land. On the institutional and policy front, the industry expanded before legislation was in place, and before 2014 there were no supply agreements in place between the government and the private sector. This meant that firms could not make production/investment decisions as there was no guaranteed market for biofuels locally, except for separate arrangements with individuals or firms. In addition, this also meant that firms could not secure finance from financial institutions using the supply agreements as security (Samboko and Henley forthcoming). The failure by the early firms was also a direct consequence of government subsidies on fuel imports (Locke and Henley 2013), with subsidies rendering biofuels uncompetitive against fossil fuels. These were since removed in 2013 in an effort to move towards cost-reflective pricing of energy products. However, present subsidies on fuel consumption in place are likely to constrain the pricing of biofuels. Interest in biofuels investment has picked up on a smaller scale in the last two years, with investments announced for a Chinese-

backed US\$150 million cassava-based ethanol plant in Luapula, and ongoing efforts by a mining company to produce biodiesel.

7.2 Mozambique

In Mozambique, biofuels became the subject of sustained policy attention in the early 2000s when the government attempted to establish small-scale *Jatropha* plantations in every district in order to diminish reliance on oil imports (Schut et al. 2010). The 2007 Rural Development Strategy included as an objective the development of alternatives to traditional fuels, including from sugarcane, sweet sorghum, *Jatropha*, and other crops. The same year saw the approval of the first biofuels project. Government backing for the biofuels sector increased in subsequent years with the launch of the National Policy and Strategy for Biofuels, adopted in 2009. The policy pursues several objectives, which include:

- ‘promoting sustainable production of biofuels;
- reducing the country’s dependence on imported fossil fuels;
- diversifying the sources of energy; promoting sustainable rural development;
- contributing to foreign exchange generation through increased exports;
- exploring regional and international markets;
- promoting research on technologies for production of biofuels by national teaching and research institutions including technologies applicable to local communities;
- promoting food and nutritional security;
- reducing the cost of fuel for the final consumer; and
- protecting the national consumers against the volatile prices of fossil fuels and energy insecurity’ (Nhantumbo and Salomão 2010).

The policy also sets out a list of conditions to prevent the planting of biofuel feedstocks on sensitive areas, and to limit their impact on biodiversity. However, these provisions did not receive adequate attention from either investors or government agencies monitoring the evolution of the sector, and the list of concerns surrounding the potential rapid pace of expansion in the absence of effective planning resulted in the government announcing a moratorium from 2009 to 2011 until national land use planning had been carried out (Schut et al. 2009). In order to improve planning of biofuel developments, in 2014 the government of Mozambique was in the process of approving the biofuels sustainability criteria framework document, which specifically mentions that investments should not negatively impact local food security. Operators must provide evidence that they are following a plan to maintain access to basic food crops in the region compared to the situation before operations. No mandatory percentage of land allocated for food production is mentioned in the strategy or sustainability criteria (Schut and Florin 2015).

The policy also calls for operators to create employment and broader conditions for local economic development through purchasing feedstock from neighbouring farms (Schut and Florin 2015).

Political economy issues explaining lack of progress on biofuels promotion and regulation

Despite the well-developed policy and regulatory framework for biofuels in Mozambique, production and consumption in the fuel sector have yet to take off, with the only commercial success so far being the production of ethanol gel. While the lack of economic viability of *Jatropha* explains much of the failure of biodiesel production, the industry has encountered a broader set of challenges. Getting access to finance in the wake of the 2011 financial crisis became difficult for all operators, especially since a large number of producers in Mozambique included in their

strategies plans to export to the EU; when this option was closed the plans became unviable. Operators complained that gaining access to land use rights that provided investors with security to invest further was a major hindrance (Atassanov 2013). More broadly, difficulties in gaining access to land for sugarcane production have been a hindrance.

7.3 South Africa

Policy on biofuels

In 2007 the South African government committed to a short-term goal in the production of biofuels, amounting to 2 per cent of the total road transport pool. To date, large-scale procurement has not yet commenced. According to the Biofuels Industrial Strategy, mandatory blending was expected to commence in October 2015. However, this has not materialized and the government is currently in the process of developing mechanisms to reduce the impact of large-scale biofuels production on food security and also looking into a biofuels financial support or subsidy mechanism (Roelf 2015). The latter is being undertaken by an interdepartmental Biofuels Task Team, which is developing the Biofuels Regulatory Framework.⁴

A Biofuels Feedstock Protocol that aims to address food security concerns has been developed to safeguard the switching from production of food to biofuels feedstock. Among the conditions in the Protocol is the use of idle land for commercial and small-scale feedstock production under rain-fed conditions. Furthermore, the use of maize and potatoes for biofuel production is prohibited (Department of Energy 2015).

Political economy issues explaining lack of progress on biofuels promotion and regulation

The Department of Energy (DoE) is mandated to ensure the secure and sustainable provision of energy for socioeconomic development. Electricity supply is at the core of South Africa's domestic energy priorities, given that 30 per cent of households do not have access to electricity, and those that do cannot afford it (Gets 2013). Therefore, the 'DoE places emphasis on broadening electricity supply technologies to include gas and imports, as well as nuclear, biomass and renewable energy resources (wind, solar and hydro), to meet the country's future electricity needs and reduce its carbon-dioxide (CO₂) emissions' (Department of Energy 2015).

In terms of land, rural, and agricultural development, the abolition of apartheid in 1994 in South Africa ushered in a process of redressing past injustices through land reform and a broad-based programme of economic empowerment of the black population in the agricultural sector. It is important to note that the land issue remains racially charged in South Africa, and redressing the land alienation and dispossession that occurred since 1913 is a constitutional imperative (Government of South Africa 1996). Any policy to promote large-scale cultivation of biofuel feedstocks therefore requires consideration of how this intersects with efforts to redistribute land.

The government set itself the target of delivering 30 per cent of commercial agricultural land by 2014, which is 24.6 million hectares (Pepeteka 2013). However, this has not been achieved, with only 7.5 per cent or 7.5 million hectares of land exchanging hands from white to black farmers. According to the government, 'it has paid out 71 292 claims on land reform instead of transferring land' (Nkwinti, quoted in Nxumalo 2013), which therefore signals far greater progress than is indicated by looking at what area of land has been transferred alone. Reasons cited for the

⁴ At the time of writing, it is unclear whether the regulatory framework has been approved by the cabinet; indications from industry suggest that the process is currently in limbo.

preference for cash payments over land include the rate of urbanization and reliance on wages rather than farming for income for the majority of potential beneficiaries.

However, agricultural development remains an important priority sector, as identified in the National Development Plan (NDP), with support being channelled to subsistence and smallholder producers in rural areas. In addition to the above, the NDP also states that agriculture has the potential to create close to one million new jobs by 2030 (Department of Agriculture 2015). While there is no explicit mention of the role of feedstock for biofuels in the strategic plan objectives, mention of employment creating opportunities is highlighted, which is one of the motivating factors for the development of a biofuels industry in South Africa.

Areas of interest at the regional level

South Africa's regional integration approach involves market integration, regional infrastructure development support, and coordination with the aim of boosting intraregional trade and diversifying production. In 2016, South Africa has made Africa its priority trading partner and aims to double its exports to Africa (Department of Trade and Industry 2016). Other continental initiatives that South Africa is committed to include regional peace, security, and stability, as the key determinants for socioeconomic development on the continent.

8 Trade aspects: opportunities and limitations for trade among SADC countries

8.1 Trade agreements: implications for biofuels trade

Countries in the region have signed agreements that impact on trade at the bilateral, regional, and multilateral levels. Of importance to this analysis are agreements at the (1) multilateral level, where all countries under review are members of the World Trade Organization (WTO) and as such are bound by the rules enshrined in the different instruments contained under the WTO; and (2) SADC level, where all countries are members and signatories to the SADC Trade Protocol. It is important to note that while there may exist instruments related to treatment of biofuels trade, some of them are not legally binding and as such countries may choose to ignore them.

Multilateral level: the WTO

The WTO deals with the rules of trade between nations at a global or near-global level. The WTO agreements are the legal ground-rules for international commerce, and guarantee member countries important trade rights. Non-discrimination and transparency are at the core of the principles governing the WTO. South Africa, Mozambique, and Zambia are all signatories to the WTO and therefore are bound by these principles. The WTO rules also bind governments to keep their trade policies within agreed limits for everybody's benefit.

Issues affecting biofuels at the multilateral level revolve around how they are classified and the treatment of subsidies, given the reality that some incentives/subsidies may be required to kick-start the development of the biofuels sector in the respective countries under review. Harmer (2009) highlights issues for consideration by policy makers when dealing with biofuel subsidies and WTO rules. For South Africa, the issue of subsidies needs further interrogation, given that it is in the process of finalizing the Biofuels Regulatory Framework. There is a provision in South Africa's biofuel policy that allows for subsidies, which are consumer-funded through a general fuel levy (Biofuels-News 2015)

Here we note with caution that the provision of subsidies that are expected to be consumer-funded may likely be in conflict with the WTO Agreement on Agriculture (AoA) rules, which require that subsidies that are allowed and that can be classified as green box support should meet two criteria. First, programmes should not involve transfers from consumers and not provide price support to producers; they must be publicly funded. Second, specific policy criteria contained in Annex 2 of the AoA must be met (International Policy Council 2006). Programmes that fail to meet both sets of criteria do not fall in the green box and must be reported to the WTO as amber box subsidies.⁵

Biofuels trade under the SADC: preferential access

On the regional front at the SADC level, the SADC Trade Protocol applies as all countries under review are members to it. In terms of trade, since the SADC region is now a free trade area (FTA), substantially all goods originating from Member States should enter each other's jurisdiction duty-free, and therefore duty-free access applies to fuel or feedstocks from the region and more specifically into Mozambique, South Africa, and Zambia, which have substantially liberalized their markets. Use of feedstock from third-party countries will be restricted by the strict rules-of-origin requirements that confer origin, and in this case should be wholly obtained from the region (SADC 2003)

In terms of trade, it is therefore anticipated that under the current trade regime, there should be no trade restrictions. This essentially means that biofuels and feedstock should not currently attract tariffs. A search for the current tariff schedules as reported by the United Nations ITC MacMap database indicate that all goods (i.e. bioethanol and feedstocks) enter duty-free in the respective markets (www.macmap.org). A challenge, however, exists due to the weak legal and institutional arrangements in the SADC, where some governments take unilateral actions that are contrary to their legal obligations under the SADC Trade Protocol to not impose new tariffs or new non-tariff measures (Erasmus 2015). Reasons for imposing protective measures include the popular infant industry clauses, export bans, import licensing, and surtaxes, among others, which bring their own complications with regard to transparency, suitability, and the duration of such protection measures. The implications are that uncertainty of supply is created, which may affect the cost of biofuels in the region.

8.2 Non-tariff barriers affecting trade

While NTBs are prevalent and should be seriously considered, we are of the view that domestic regulations or standards will impact on biofuels trade significantly and may become a barrier to trade. In the SADC, harmonization of policies and standards is a priority, as is the elimination of NTBs. As such, given the political will, regulations and standards should not be a major barrier. However, worth mentioning in the case of biofuels is that there is a wide range of internal regulations that may impact trade. These include (International Policy Council 2006):

- mandates to use particular percentages or quantities of biofuel either in fuel blends or for specific purposes (such as bus or taxi fleets);
- restrictions or limits on the amount or kind of biofuel that can be contained in a blend with conventional fuel;
- specifications of the properties or performance characteristics of particular biofuels or the materials they must be derived from;

⁵ For more information on the colours of subsidies under the WTO AoA—domestic support, see: www.wto.org/english/thewto_e/whatis_e/tif_e/agrm3_e.htm.

- labelling for consumer protection and information purposes;
- health and safety regulations concerning the handling and transportation of particular biofuels or inputs required for the processing of biofuels, and related specifications for processing plants; and
- broad environmental performance requirements related to the entire life cycle of the product, including the sustainability of the agriculture used to produce the feedstock from which the biofuel is processed.

The foundation of the WTO approach to internal policies is the principle of non-discrimination (national treatment) as contained in Articles I and Article III of the General Agreement on Tariffs and Trade. This obligation also applies with respect to internal policies and extends to all imports from WTO members; therefore, the countries under review must comply lest they may be taken for dispute resolution or face retaliatory measures by other members.

8.3 Challenges for regional cooperation on biofuels

The main challenge for the SADC is the lack of policies and strategies, as well as the existence of weak institutions to ensure that the renewable energy projects identified in the Regional Infrastructure Development Master Plan are implemented. Further impediments are caused by the complex connection of biofuel with diverse issues such as energy, agriculture, industry, environment, land, and natural resources, which call for different responsibilities and contributions at different levels and capacities. This is reinforced by the lack of action plans or explicit priorities as an indication of the policy at the national level.

It is important therefore to emphasize that while the Protocol on Energy and the Regional Indicative Strategic Development Plan address the SADC's broad energy objectives, they make little mention of renewable energy aside from hydropower, and there is no region-wide regulatory framework that specifically addresses renewable energy.

Moreover, although the regional agreements focus on adopting coordinated approaches for bioenergy development, there is little indication that trade in bioenergy products is envisaged, or is a major driver for countries to develop the sector.

In addition, a further reason for the lack of movement on biofuels is that this has not received the necessary prioritization and action by Member States, who are more focused on deploying their scarce resources on issues of higher priority in the energy sector, namely electricity power sharing.

Beyond the challenges highlighted above is also the perverse culture inherent among SADC states of not honouring commitments and the lack of monitoring and enforcement of regional agreements. A case in point is the collapse of the SADC Tribunal, which was initially established to ensure that Member States abide by regional agreements. It was disbanded after Zimbabwe had an unfavourable ruling against its land reform policy (see the SADC website). The above section highlights that while each of the countries has made some progress in launching biofuels policies, they have not been finalized to a point where they have stimulated processing and blending of biofuels. In the case of South Africa, the lack of a pricing formula and final approach for how to apply for subsidies has delayed progress and made the government miss its 2015 deadline for production.

However, as most feedstocks are also sources of food, the issue of food security and competition for land, as already noted, makes biofuels production a tough sell in an environment where countries are constantly experiencing hunger due to drought-related food shortages. This therefore makes the production of food a national/sovereign issue. In order to ensure self-sufficiency,

countries in the region in the past have categorized most food or agricultural products as sensitive and therefore subject to high tariffs, which helps to promote and boost domestic production by restricting imports (Fundira 2011). Due to the SADC FTA, products categorized as sensitive have been phased out in accordance with the phase-down concessions made by countries. To date, in principle, all countries must have phased out sensitive products, with the exception of Angola (not party to the FTA) and the Democratic Republic of the Congo (requested derogations); Malawi and Zimbabwe, which had also requested additional time, are in compliance.

Beyond biofuels, the driver of political will is social pressure. In the SADC, typical African problems such as severe poverty, low-levels of investment, poor infrastructure, and socioeconomic factors such as health care, education, and food security are high on the priority lists. Consequently, topics such as biofuels have a low priority and receive little attention (Cilliers 2012). According to the SADC's Regional Indicative Strategic Development Plan (RISDP), the following are sectoral cooperation and integration intervention areas:

- trade/economic liberalization and development;
- infrastructure support for regional integration and poverty eradication;
- sustainable food security; and
- human and social development.

Energy is mentioned under infrastructure support, but this is targeted mainly at electricity generation and supply (SADC 2007)

The emergence of an SADC market may need to be facilitated by supportive trade policies, because it may not be possible to attract the necessary production investment if non-SADC ethanol were to be allowed to enter the market unimpeded at a lower price. The fact that there exist low-cost producers of ethanol from non-SADC countries such as Brazil presents a challenge for the region, given that most SADC members are bound by WTO rules that have left them with limited policy space to increase tariffs on ethanol to reduce imports.

Currently, tariffs for ethanol applied on a non-preferential basis are below 10 per cent for all countries under review. South Africa uses quotas; its in-quota tariff is 9.56 per cent and out-of-quota rate is 119.4 per cent. Mozambique and Zambia have no quotas in place, with non-preferential tariffs (most favoured nation) at 7.5 per cent and 5 per cent, respectively (www.macmap.org).

8.4 Opportunities offered by trade institutions

There are a number of opportunities that rural communities can derive from bioenergy production. Through the provision of electricity and consequent services, rural communities are able to increase their income and livelihoods. In this section we highlight some of the opportunities for SADC producers that prevail in the biofuels market for countries under review (UNCTAD 2013).

For a viable biofuels market in SADC, there needs to be large-scale production of ethanol. Traditional markets in the North, such as the US and EU, and the emerging markets such as Brazil and China, are already big producers and therefore would be well placed to supply to a nascent South African market. Thus, for an initial period at least, effective, coordinated import measures and other forms of regulation may be necessary across the SADC to encourage the development of national production bases.

A regional renewable fuel policy could call for Member States to promote and support the production and consumption of SADC ethanol, similar to Annex VII to the Protocol on Trade,

which seeks to support SADC sugar production.⁶ Part of the objectives of the Annex is ‘to provide temporary measures to insulate Member States’ sugar producing industries from the destabilising effects of the distorted global market, and in this regard to harmonise sugar policies and regulate its trade within the region during the interim period until world trade conditions permit freer trade in sugar’ (SADC 1996: 92). This position by Member States would have to extend to new trade negotiations such as the Tripartite Free Trade Area, which comprises the SADC, Common Market for Eastern and Southern Africa, and East African Community, as well as the envisaged Continental FTA to ensure an expanded market.

9 Conclusion

While proponents of biofuels continue to argue that there is scope for biofuels development in the SADC to develop rural areas, increase rural incomes, and enhance both food and energy security, biofuels projects have largely failed to develop. While previously global market trends and policies in importing countries suggested a window existed for biofuels projects in developing countries to both attract finance for project development and to find export markets overseas, more recent changes in developed country biofuel policies and global market conditions have reversed these opportunities. In addition, experience to date suggests that translating this potential into reality requires overcoming a number of challenges, some of which have limited development in the agricultural sector for decades. These include poorly developed infrastructure, complications associated with land tenure, conflict, and poor governance, and—for smallholders—lack of access to inputs, output markets, and agricultural extension. Other critical factors include competing demands for land use that may threaten food security and the availability of water resources. Table 4 summarizes the positive and negative influences that contribute to prospects of expanding biofuels.

⁶ For more detail, see www.tralac.org/files/2011/11/SADC-Trade-protocol-Annex-VII.pdf.

Table 4: Factors with positive and negative influences on biofuel expansion

| Factors or actors | Description of Influence | For/against |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Long-term factors (international) | | |
| EU renewable energy policy and programmes | Domestic policy changes have curtailed the prospects for importing biofuels into the EU by requiring compliance with standards. | – |
| | Development assistance. EU funding for renewable energy project development in Africa has pivoted away from biofuels. Biofuels projects are no longer considered eligible for funding under the EU Africa Energy Partnership. | – |
| EU sugar market reform | Shrinking opportunities to export sugar to the EU. While African countries have offered more protection to support prices, in the long term, for sugar producers, diversification into ethanol is more attractive. | + |
| Medium/short-term factors (international) | | |
| High domestic production of biofuels in consuming countries, limited global trade | Oversupply of US ethanol leads to low global ethanol prices, which discourages investment in Africa for export. | – |
| Low oil prices | While low oil prices reduce the cost of production, they also reduce the incentives for oil importers to establish biofuel production. | – |
| Advocacy around biofuels and land grabbing | Companies are reluctant to invest in biofuels due to potential reputational risks, given the associations between biofuels, land grabbing, and negative social outcomes. | – |
| Domestic factors | | |
| Land governance concerns | Pressure from domestic and international constituencies have limited enthusiasm and scope to allocate large land concessions. | – |
| Approaches to mitigating climate change | Biofuels are considered as part of some countries' (Zambia and Mozambique) climate change mitigation strategies, but not others (as reflected in Intended Nationally Determined Contributions (INDCs)) | +/- |
| Creating investment and jobs in rural areas | Whether or not investments in feedstock expansion represent the best use of resources, there is scope to gain political capital for domestic constituencies from visible investment and new jobs in rural areas. | + |

Source: authors.

At the domestic level, there are currently unclear signals of commitment from government to enforce biofuel mandates through either purchasing offtake agreements or requiring refineries to blend biofuels with imported fuels. Part of the reason appears to be related to institutional fracturing, as responsibilities for biofuels continue to span different government departments. This suggests biofuel promotion continues to be a low priority among key decision makers in government. Similarly, this lack of prioritization is reflected at the SADC level, where interest has been focused on electricity integration and interest in developing a regional biofuels sector has been limited. Reviving interest in biofuels at this level would likely require firmer interest from national governments.

For investors, previously high levels of interest in biofuels appear to have waned in a climate of narrower access to overseas markets, more stringent requirements to access credit, and low prices for oil and sugar, which equate to thinner margins. While the anticipated fall in sugar prices resulting from reforms to EU sugar markets suggests diversification into ethanol is likely to be an attractive option, the fact that sugar prices continue to stay above ethanol prices has meant that

interest has been subdued. Awareness of social risks associated with biofuels production—both in terms of the precariousness of returns and those posed to surrounding communities—has limited the appetite for public and private investors to back bioenergy projects without a higher level of due diligence. For development partners, interest in supporting biofuels projects has waned and there appears to be less funding available for projects. For providers of concessional finance, there is increasing attention to carrying out more in-depth analysis and putting in place measures to prevent displacement and deterioration of livelihoods among those affected.

Nevertheless, analysis of trade-related dimensions suggests that if the idea of a regional market gains purchase among domestic governments, companies, and investors, trade between countries could be achieved. The major obstacle would be to clarify the biofuels regulations in South Africa to allow blenders to continue to benefit from subsidies even if imports from third countries enter into the fuel mix. Although it is currently unclear from global trends if exporters in Mozambique or Zambia would need to compete with Brazilian or US surpluses on price, it is likely some protection could be afforded through a common external tariff.

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Annex: framework for sustainable biofuels, 2010 (SADC 2009)

Objective

The objective of the SADC framework for sustainable biofuel production is to provide a set of basic guidelines for the development of sustainable biofuel strategies. These regional guidelines can in turn be adapted to meet SADC Member State requirements, e.g. recognising different legislative regimes, national development priorities, land tenure issues, and specific local conditions affecting biofuels crop selection.

A final **goal** would be for Member States to implement sustainable policies in line with the SADC framework for sustainability and mainstream these sustainable policies in biofuel relevant strategy documents (i.e. biofuel policy, poverty reduction strategy, green revolution strategy, food security strategy, budget planning, etc.).

Guiding principles (SADC 2009)

The guiding principles of the SADC framework is the development of a biofuel industry that throughout the value chain promotes:

- respect for, and inclusion of, SADC citizens in the biofuel production;
- the protection and sustainable management of biodiversity and natural resources; and
- a sustainable economic approach contributing to overall development and social well-being.

Specific principles

1. Biofuel production shall follow national relevant law and policies and, where applicable, international law.
2. Biofuel production shall be guided by free prior and informed consent by relevant stakeholders.
3. Biofuel production shall contribute positively to rural development through:
 - non-violation of human and labour rights, promotion of decent work and the well-being of workers;
 - social and economic development of indigenous, local and rural people and communities; and
 - decentralised value-added processing and local participation in the entire value chain
4. Biofuel production shall contribute positively to local and national food security.
5. Biofuel production shall respect formal and customary land rights and land use rights.
6. Biofuel production shall contribute positively to national energy security.
7. Biofuel production shall contribute positively to protect natural resources, ecosystems that provide essential services and biodiversity.
8. Biofuel production shall contribute positively to availability and quality of water and air.
9. Biofuel production shall not lead to deforestation or forest degradation and where possible contribute to rehabilitation of degraded land.
10. Biofuel production shall contribute positively to climate change adaptation and mitigation.
11. Biofuel production shall contribute positively in reduction of greenhouse gas emissions.
12. Agro-ecological zoning should provide guidance on what feedstock to use and where to plant them.