

CASE STUDY 02

Regulatory Constraints to the Development of a Fuel Ethanol Market in SADC

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Problem description

The economies of the Southern African Development Community (SADC) region are highly dependent on the importation of petroleum products. In most cases their weak currencies add to the cost of purchasing such fuels. This is exacerbated by the often-volatile global oil price and variable national exchange rates. The size of the domestic fuels market and the prohibitive cost of building refineries to refine crude oil into transportation fuels mean that the bulk of SADC states, with a few exceptions, rely entirely on imported fuels. Cost-effective alternatives are rare. Bio-diesel and fuel ethanol manufacture is limited and electric vehicles are almost non-existent.

Given the nature of the region, any solution must be cost-effective in terms of production and distribution; be based on proven, off-the-shelf technology; and utilise existing infrastructure as far as possible, so as to limit implementation costs and time.

This rules out electric vehicles, due to existing power deficits, economies of scale and the required charging infrastructure. However, renewable fuels do meet the above criteria. Impetus to the development of a SADC renewable fuels market comes from the large South African liquid fuel market and the fact that South Africa has insufficient domestic capacity to supply this market with renewable fuels. Other SADC states, on the other hand, have small fuel markets but are potentially significant sources of supply, for example Mozambique, Zimbabwe, Zambia, Angola, Malawi and Mauritius. There is therefore potential for the development of a regional market for renewable fuels.

For the purposes of this case study, sugarcane was analysed as a potential feedstock for ethanol production as the industry is well established regionally, with substantial sugarcane and sugar production and a number of existing and emerging ethanol-producing countries. Investors exist to support the sector, with much of the current investment coming from regional (mainly South African) investors with established access to project capital. Additionally, the extensive support services already offered by South African sugar industry institutions to other SADC industries, and related partnerships and knowledge transfer, will allow any production or agricultural issues to be addressed.

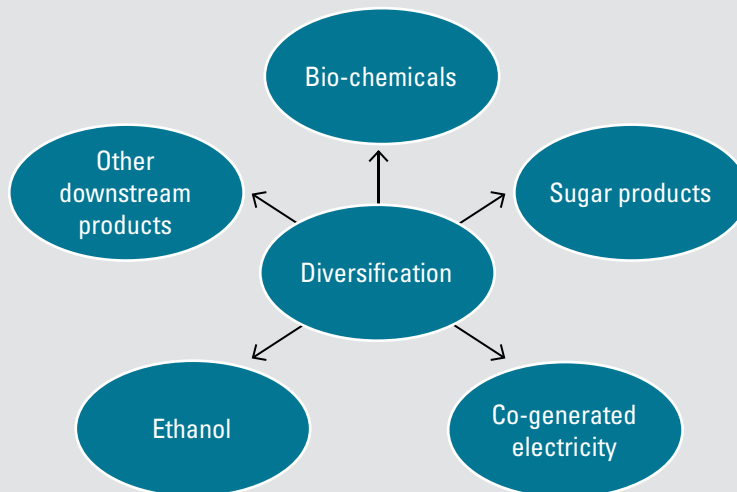
Sugar is also the only commodity group within SADC with an Annex (Annex VII) to the SADC Protocol on Trade, as well as related institutional vehicles and a policy framework. Comparable capacity for other feedstocks does not yet exist. In addition, due to the logistics of sugarcane production, sugar mills and related ethanol refineries must be built in rural areas, which 'pulls in' related infrastructure, industrial activity and support industries and increases the developmental impact of sugarcane as a feedstock. Lastly, the production of ethanol is expanding regionally, where suitable regulation exists, driven by a commercial imperative in the global sugar sector towards diversification into ethanol and chemical products and co-generated electricity. In SADC this has been accelerated by the collapse in value of the region's traditional sugar export market, the EU.

What is holding the market back? The key constraint to the development of a regional market is regulatory uncertainty in many SADC states, or the absence of such regulation. The existence of a regulatory framework for renewable fuel is a prerequisite for investment. Firstly, the boards of corporations will not approve such investment without the certainty provided by a regulatory framework (usually comprising blending mandates and agreed pricing formulas). Secondly, the existence of entrenched interests (petroleum fuel producers, importers and distributors) in domestic fuel markets often necessitates regulation to ensure the entrance of such fuels into the market.

The South African case is illustrative of these constraints. Although a National Biofuels Strategy was published in 2002 with a blend rate of 2%, it was not made mandatory and pricing was not finalised. In spite of the depth of the capital market and the investment muscle of the local sugar sector, only the promulgation of blending regulations in 2012 has allowed further progress. A regulatory framework for renewable fuel is not an anomaly, as the liquid fuels market is highly regulated both globally and within SADC. However, once

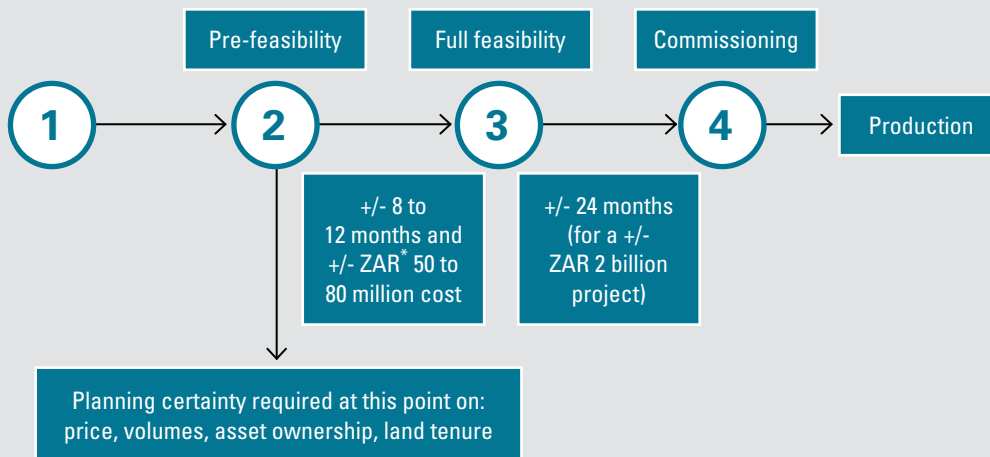
a market is established and matures, deregulation is possible, as evidenced by the evolution of the Brazilian ethanol market.

Figure 1: Diversification possibilities from sugarcane



Source: Adapted from Riddle L, Presentation to International Sugar Organisation Workshop, Arusha, 31 May 2011

Figure 2: Ethanol project cycle and regulatory certainty

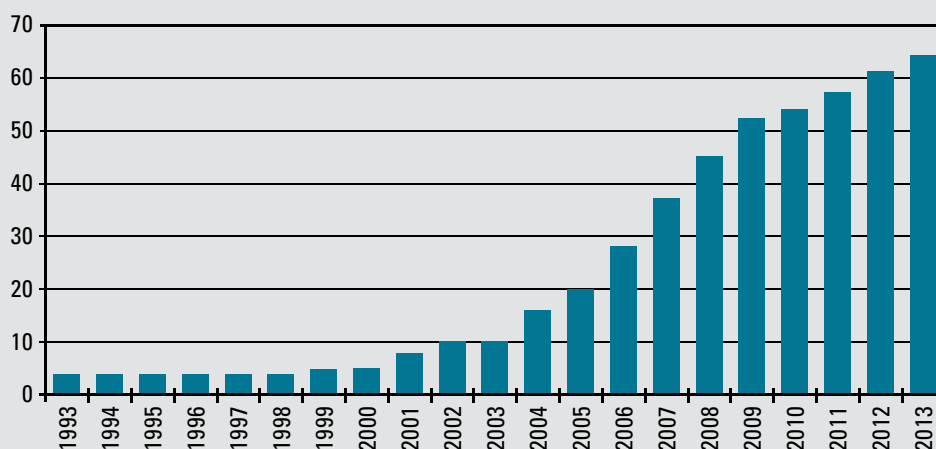


* ZAR is the three-letter currency code for the South African rand.

Source: Kruger N, Presentation to the Federation of SADC Sugar Producers Conference, Durban, 12–14 July 2011

Secondary constraints may include the relatively cheap price of fossil fuels due to an absence of full lifecycle accounting (which would take into account environmental costs), inadequate institutional frameworks, difficulties in accessing financing, lack of national biofuels standards, lack of tariff and standard harmonisation, lack of integration into distribution networks, unclear benefit-sharing among producers, and uncertain investment promotion mechanisms.¹

Figure 3: Expansion of ethanol-producing countries, 1993–2013



Source: BP, presentation to the 22nd International Sugar Organisation Seminar, London, UK, 27 November 2013

The payoff for member states and the SADC region for addressing at least the regulatory constraint would be enormous. It is calculated that up to 60% of new SADC petrol requirements over the next 20 years, growth included, could be met using only 2–4% of the available cropland and 6 000–9 000 MW electricity could be generated, equivalent to 12–18% of 2011 required capacity. This would require 120 sugar mills with a production capacity of 320 000 tonnes of sugar each per year. It is estimated that a remarkable 1.5–1.8 million direct jobs and 4 million indirect jobs could be created through such diversification. Local sourcing of necessary parts and services will provide significant opportunity for industrialisation and value chain development (eg, ethanol plants in SA would require ZAR 20 billion in parts and services, with 60% expected to be sourced from South African suppliers²).

1 Brown R, 'Policy Support for Bioenergy in SADC', presentation to the Federation of SADC Sugar Producers Conference, Durban, 12–14 July 2011.

2 Tongaat-Hulett, 'Sugarcane Potential, Food and Energy', presentation to the Department of Energy, 31 October 2013, <http://www.energy.gov.za/files/IEP/DurbanWorkshop/TH-Sugarcane-Potential-Food-Energy-30Oct2013.pdf>.

Table 1: State of ethanol regulatory play in SADC

Country	Blend rate	Regulatory status
Malawi	20%	Possible 100% (with conversion units)
Mozambique	10%	<ul style="list-style-type: none"> • National policy & strategy • Investment criteria • Dedicated biofuels agency
South Africa	2–10%	<ul style="list-style-type: none"> • No pricing framework agreed yet • 4c/l fuel levy announced • Biofuels Implementation Committee • National strategy
Swaziland	10%	<ul style="list-style-type: none"> • National Biofuels Task Force • National strategy & action plan • Pricing model being finalised
Tanzania	Possible 10% blend by 2030	<ul style="list-style-type: none"> • National Biofuels Task Force • Investment criteria • Dedicated biofuels agency • Guidelines • Liquid Bioenergy Policy & Act being drafted
Zimbabwe	5%	Possible 10%

Source: ISO, 2013, *Future Role of Sub-Saharan Africa in World Sugar and Sugar Crop Renewable Energy*; and Brown R, 'Policy Support for Bioenergy in SADC', presentation to the Federation of SADC Sugar Producers Conference, Durban, 12–14 July 2011

Outside SADC there are a few other examples in the broader Southern/East African region. Ethiopia introduced an E5³ ethanol mandate in 2009, Kenya has advanced plans to introduce an E10⁴ mandate and Sudan has an E5 mandate in place.⁵

Political economy analysis

Five key political economy issues must be addressed: the use of food crops for fuel; resistance from established liquid fuel interests; land ownership; national versus regional energy security; and regional trade policy for ethanol.

With respect to food vs fuel, the linkage is weak in that sugarcane is not a crop that is consumed directly, and sugar is not a staple food in the sense that maize or potatoes or yams are. Sugarcane is also not frost tolerant and requires specific agronomic conditions, which

3 E5 stands for a 5% blend of ethanol with petrol/gasoline.

4 E10 stands for a 10% blend of ethanol with petrol/gasoline.

5 ISO, *Future Role of Sub-Saharan Africa in World Sugar and Sugar Crop Renewable Energy*. London: ISO, 2013.

limits its growing regions. Due to the long crop establishment stage, sugarcane is also not an easy crop to switch to. Lastly, sugarcane is a monopsonistic product, ie, there is only one buyer, the sugar miller. This acts as a deterrent to entry for food crop farmers, who are used to being able to sell to a range of buyers. As a result, by regulating sugar mill numbers it is possible to cap the number of sugarcane plantations, thereby affording governments' significant control over the expansion of the sector. In addition, regional governments should enact land use legislation to guard against direct and indirect land use change.

The second key political economy issue is the reluctance of established interests in the liquid fuel sector (eg, domestic petroleum companies or foreign multinationals) to accommodate the entrance of new sources of supply, which would dilute their market share. Resistance to such competition can, however, be overcome through regulation. It is possible that established players may eventually also choose to produce bio-ethanol, but it is likely that the returns from sunk production investment will be better.

The third issue relates to land ownership, with opponents of renewable fuels noting that the production of such crops on a commercially feasible scale requires large plantations, thereby displacing subsistence/small-scale farmers in rural communities. The solution is to incorporate existing communities into envisaged investments, whether as communal sugarcane farmers or as service providers to the farms and mills. Local communities must not be displaced and, if they do not wish to undertake sugarcane farming, an agreed negotiated solution must be followed with support from civil society.

The fourth issue is the potential desire of governments to place national energy security interests above regional interests. Governments might therefore attempt to direct production to meet domestic ethanol needs first through import and export restrictions.

The fifth issue concerns trade policy. It may not be possible to attract the necessary production investment if non-SADC, subsidised, imported ethanol enters the market unimpeded and at a lower price. The sugar sector is heavily regulated and supported globally and trade in sugar is severely affected by such measures, leading to most producers imposing defensive import measures. To do otherwise in the absence of the multilateral liberalisation of the sector has proved unviable for nearly all producers. For an initial period at least, effective import measures and other forms of regulation may be necessary to encourage the development of national production bases. This could be followed by phased liberalisation. Such measures could make provision for imports under extreme situations such as drought, so as to preserve the consumer base.

The way forward

It is apparent that the production of ethanol from sugarcane holds enormous promise for national and regional development. The sugarcane plant has potential benefits unmatched by other field crops. The production and commercialisation of sugarcane-derived products hold great potential for governments to develop domestic chemical and energy sub-sectors. The following steps could make such a regional ethanol market a reality:

- Implement regulation at the national level (blending mandates, pricing arrangements).
 - › Focus advocacy efforts on states where policy development has slowed or stalled. Within South Africa specifically, advocacy could focus on the achievement of the 2015 implementation date, and related to this, a quick finalisation of the Department of Energy's research process.
 - › Compile a regional summary or database of best regulatory practice and circulate it among regional states.
 - › Raise awareness among regional structures, governments, producers and investors of the developmental and commercial merits of a regional ethanol market, the role that the South African market would play, and constraints to the emergence of such a market.
 - › Source and provide technical national regulatory assistance, as well as additional support for the SADC Regional Petroleum and Gas Subcommittee and the SADC Secretariat Energy Division. This can involve the SADC Energy Sector Thematic Group (a partnership between SADC and international co-operation partners).
- Mobilise investment in capital equipment for ethanol production.
- Manage import measures on ethanol and trade in ethanol through an annex to the SADC Protocol on Trade to promote intra-SADC trade in SADC-produced ethanol. Similarly a specific protocol may be required under the Tripartite Free Trade Agreement.
- Use the Clean Development Mechanism to offset the investment required.
- Carefully allocate new land use to ensure that there is not a negative impact on food security, and pass related legislation.
- Incorporate communities into decision-making and project planning and implementation, to safeguard land ownership and community rights.
- Strengthen farmers' associations to empower farmers.
- Monitor pricing regulations and boost regional customs co-operation to prevent the emergence of black and/or arbitrage markets for fuel ethanol.
- Establish national research institutes, funded by industry. Alternatively, ensure dedicated government research capacity.
- Establish renewable energy development agencies where these do not exist.
- Include SADC Secretariat structures in advocacy efforts: the SADC Energy Hub; the SADC Regional Petroleum and Gas Subcommittee; the SADC Secretariat Energy Division; and the SADC Energy Sector Thematic Group.



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