

Greening Economic Growth in SADC: The Role of Trade Policy¹

By

Betchani H. M. Tchereni²

Abstract

The level of energy poverty in Southern African Development Community (SADC) block is abysmal. Apart from South Africa, the rest of the countries in SADC have less than 50% of their populations electrified. Households still depend on biomass sources of energy such as firewood, animal dung and crop residues for day to day activities requiring energy. In addition, biomass is used in inefficient tools leading to more energy losses. A myriad of solutions have been suggested ranging from renewable energy to energy trade mechanisms. The role of international trade in promoting the production and market access of environmental commodities is crucial for the greening of the African economies. Properly designed trade policies are important in promoting the diffusion of environmental goods and services. This paper analyses the state of energy trade in the region through reviews of relevant reports and academic literature. In addition the paper seeks to assess the factors behind poor adoption of renewable energy and other environmental goods and services especially for large scale production in order to determine whether SADC region is keen to adopt green growth strategies. The paper further discusses the role and potential of infrastructure development in contributing to the greening of the growth path of the region. It concludes by investigating the effectiveness of the SAPP in making modern energy accessible to all in the region.

Key Words: Energy, policy, bilateral, trade, multilateral, power pool, philanthropy

1.0. INTRODUCTION AND BACKGROUND

Among the many problems facing the Sub-Saharan African (SSA) region today is poor energy supply for both industrial and household use. Noteworthy is the fact that over 90% of the population depend on Biomass (International Energy Agency, 2012; Davidson, Chenene, Kituyi, Nkomo, Turner, & Sebitosi, 2007). More critical is that the region has nations with surplus clean and sustainable power; such as Mozambique while others, such as Zimbabwe and Malawi rely on traditional and unreliable sources of energy to a greater extent. Additionally, the common cooking mechanism in households is inefficient. For instance a three stone fire using firewood or homemade stoves that release more heat to the atmosphere than for the intended purpose is common among the households (Tchereni, 2013; Karekezi & Kithyoma, 2003). Tobacco farmers in Zimbabwe, Mozambique and Malawi depend on firewood to cure their harvests. In addition, due to high prevalence levels of poverty and lack of affordable and reliable power supply, people are less concerned about climate change and care more about whether they will be able to get some useful energy facilities for their household and industrial uses.

¹ The paper benefited from a financial assistance from the South African Development Bank through MISTRA's 'Earth, Wind and Fire' Commissioned Project.

² Betchani Tchereni is a Senior Researcher in the Faculty of Political Economy at Mapungubwe Institute for strategic Reflections (MISTRA) and Senior Research fellow in Economics in the School of Economics at the North-West University Vaal Triangle Campus.

The poor supply and unreliability of power has made it expensive and unaffordable to many people in the region. The high cost of power supply has forced people to use biomass for baking of bricks for infrastructure development. Inefficient traditional ovens depend on large quantities of wood to be baked and made ready for any building project.

As is widely reported, many African countries have faced a power supply deficit during the last decade. In 2008 there were approximately 25 countries facing a power deficit. There are many reasons for a power deficit, but the most compelling reasons are the poor planning and lack of maintenance of existing facilities. Although financing has been key impediment to increase generation capacity, the level of the deficit could have been reduced significantly if adequate planning and maintenance were applied. In addition, the lack of involvement of private sector as well as the low capacity of public institutions to address those issues have also been key negative contributing factors. Also, unfortunately “regional” programs and regional planning have not been integrated adequately (Kambanda, 2013). Further there has been absence of synergies between national and regional power supply strategies.

Table 1: Number of People without Access to Electricity and Relying on Biomass in 2009 and 2012

	Number of people lacking access to electricity	Number of people relying on the traditional use of biomass for cooking
Africa	587	657
Sub-Saharan Africa	585	653
Developing Asia	799	1937
China	8	423
India	404	855
other Asia	387	659
Latin America	31	85
Developing countries	1438	2679
World	1441	2679

Source: IEA (2012)

Whilst in 1996, SADC region had seven countries facing short supply of power and five countries enjoying over production of electricity (Muntschick, 2013), the current situation is that nearly all countries but Mozambique are likely to be needing extra power supply to meet high demand. One of the ways through which this extra demand can be satisfied is by engaging in overt and more direct power trade with countries having oversupply. However, these problems are occurring in the face of advanced and new energy facilities invented in many parts of the world. Despite the availability of

sunlight for at least 10 hours a day and free moving wind, Africa and particularly the SSA is still facing energy supply problems. This has led to efforts to achieve green economy targets difficult.

Many scholars and scientists lament that the solution to these problems is mainly a function of adequate and reliable supply of renewable energy (RE) (Wentworth, 2014; Karekezi & Kithyoma, 2003; Belward, et al., 2011). RE has many benefits ranging from being readily available for many in need, to helping in cleaning the environment due to low emissions of greenhouse gases to regeneration at a faster rate than its use. The discourse on green growth centres on the need for the world, including Africa, to speed up the process of adoption of green/renewable energy. This then would be a greater portion towards the contribution of green economy.

For the SADC region, there is a realisation that energy trade could be the solution to increase access to affordable and reliable energy in the member states that face poor supply. This has been acknowledged by the member states of SADC who, in 1995, responded by establishing the Southern African Power Pool (SAPP), a platform on which trade in energy particularly power occurs. SAPP was born out of the realisation that abundant energy resources were available in some parts of the region while others were lacking. For example, a large reserve of low-cost hydroelectricity in the northern part (especially the Inga Reservoir in the Democratic Republic of Congo and the Cahora-Bassa Reservoir in Mozambique), large reserves of cheap coal in South Africa, and the Kariba Dam (on the border between Zambia and Zimbabwe) (O'Leary, Charpentier, & Minogue, 1998) were seen as resources that could supply not only enough but also excess power beyond their domiciled regions of endowment.

Apart from trading in energy facilities to even out supply, greening the growth path of the region is also part of the objective function of the energy authorities. The effects of differences in energy supply across the region include acute deforestation in some countries where fuel-wood is depended upon for energy needs. This coupled with other factors such as generating electricity using coal and petroleum based fuels, has the potential of leading to climate change conditions. Climate change is overtly affecting rain cycles and heavy siltation in low lying areas. Many rural areas in this case would require off-grid power options to provide energy. Energy trade agreements and platforms should go beyond on-grid resources. Investigating institutional set ups guiding, influencing and directing trade and investment in Renewable Energy Technologies in the region is imperative. Apart from renewable energy technologies, green economy comprises of five other elements namely green and efficient infrastructure (including buildings, roads, airports etc), efficient and clean transport systems; sustainable water management and conservation methods; blue economy aspects of waste management and recycling; and land management (Wentworth, 2014). Thus green growth not only in a country but also in the region as a whole can be achieved better through an integration of economic activities hinging on infrastructure development to service delivery apart from an effective and efficient energy trade platform.

The shift from what are generally considered as environmentally unfriendly commodities to green goods and services is one that requires board policy shifts. International trade and industrial policy can play a crucial role in facilitating the acceleration of production, diffusion and uptake of environmental commodities. This stems from the fact that the technology to enable the adjustment to green industrialisation is limited to already advanced countries (Bucher, Drake-Brockman, Kasterine, & Sugathan, 2014). Therefore, crafting trade strategies that are amenable to the provision of innovative technologies in African countries could reduce the cost and therefore improve the trajectory towards a green economy.

Free trade is a very challenging issue for most countries trying to balance sourcing of renewable energy components at minimized cost whilst encouraging a local manufacturing ecosystem (Nampoothiri & Manoharan, 2013). Renewable energy components are all imported from Asia,

Germany and the USA. This raises strong memories of what Africa has been made over the past 50 years. Mainly, it has been used as a market and a power consolidation base where colonial geopolitical economy wars are fought, silently (Shikwati, 2006; Lall, 2004).

It is an important observation to make that at the heart of the value chain of renewable energy facilities; the aspects of production do not take place in Africa. This then raises concerns regarding quality of some of the products and whether their physical built is focused to the African economic and climatic conditions. In Africa, it is mainly entrepreneurs indulging in distribution that forms the market for renewable energy. Efforts to create more green jobs are then thwarted. For example, China is the leading producer of low cost solar panels for household use (Cassel, 2013) many of which are exported to poor regions of the world including the SSA.

The purpose of this chapter is to examine the state and effectiveness of energy trade in the SADC region. In addition the chapter seeks to assess the factors behind poor adoption of renewable energy especially for large scale production in order to determine whether SADC region is keen to adopt green growth strategies. Further, an examination of the role of the booming infrastructure development and energy demand-supply nexus is provided. Greening of the growth path of the SADC region, particularly in a situation where building projects depend on baked bricks powered by firewood. The chapter concludes by investigating the effectiveness of the SAPP in making modern energy accessible to all in the region.

An understanding of the legislative framework and energy policy related to the facilitation of manufacturing, trade and use of modern sources of energy within the southern African region is important if a green SADC region will have to be achieved.

The development of the chapter depended on information sourced from various government portals including the Southern African Development Community' secretariat. Additionally, a field trip to Malawi's Ministry of Energy provided further insights on the functionality of energy trade in the region. A consultation of journal articles, reports and websites such as that as the SAPP was also vital in informing the arguments presented in the chapter.

The next section provides a situation analysis of the state of energy supply in SADC region. Section 3 examines the effect of infrastructure development on green economy efforts. The following section provides an exposition of existing trade barriers affecting the efforts aimed at greening SADC's energy ladder. Two sections discussing the state of trade in general and energy trade in particular in the region are situated before recommendations and a conclusion of the chapter.

2.0. The State of Energy Supply Side in the SADC Region

The SADC region has made significant strides in undertaking and committing to the building of more power supply infrastructures. Out of the 12 mainland countries, nine are now interconnected to the regional grid making it possible for them to participate as traders in the power pool. There are many sources of energy supply in the SADC region forming an energy mix. These energy resources include hydropower, coal, nuclear, natural gas and petroleum based power generation. According to (Zhou, 2012) the region electricity generation mix is dominated by coal, which in 2010 accounted for 74.3% of the energy mix, hydro 20.1%, nuclear 4% and diesel 1.6%. There are medium- to large-scale renewable energy projects mainly from wind and solar..

The current status is that the region is facing a critical shortage of power supply to its citizens. As of 2011, the whole region had a total installed capacity of 56GW of electricity. Although this is the case, most of the countries in the region face deficits of power supply. The evening out of power supply is hampered by among other factors a poor and uncoordinated transmission system of power across

the region. The access to electricity is still limited in the region as seen by the low access to electricity in rural areas of the SADC Member States. Access in these areas is below 30% for eight of the 12 SADC States on the mainland. In comparison to other Regional Economic Communities (RECS), SAPP's access to electricity at 24% lags behind that of EAPP (36%) and the West Africa Power Pool (WAPP) (44%). This leads to the unbalanced supply where some countries have surpluses while others in a state of lack (Zhou, 2012).

However, the building of a 400KV line in 1995 that interconnected the 'Thermal Southern Network' depending mainly on coal and gas to generate power and a 'Hydro Northern Network' using hydropower for electricity needs made it possible to create a market for power (Maupin, 2013).

Africa, unlike the developed world, has the opportunity to leap-frog the energy ladder trajectory by adopting cleaner and sustainable energy resources. While the developed world need to make a difficult and expensive choice of dismantling and/or abandoning the highly emitting energy resources before migrating to the modern sources of energy, the developing world in general and the SSA in particular simply need to make a choice that it will adopt the new resources of energy (United Nations Industrial Development Organisation, 2008). This is on the account of the excess demand which exceeds supply. By planning to meet the excess demand through supply of energy sourced from renewable resources, the region has the opportunity to be the greenest economic block in the world.

Although her emission of pollutants responsible for climate change is only at 3% of the global total, Africa cannot relax to follow the trajectory of industrialisation of using dirty energy resources such as oil and coal. However, coal will remain a major player as a source of energy in the region due to the large endowments in deposits the region has. Consequently, the African Development Bank proposes the adoption of cleaner coal power generating technologies that captures the pollutants and stores them in nth round rather than releasing them into the atmosphere (Kambanda, 2013).

Arable land in some parts of the SSA region has been dedicated to biofuel related agriculture. For example, Mozambique and Malawi have top quality arable land dedicated to Jatropha, Sugarcane and Maize which are used for the production of biofuels such as jet fuel; biogas and ethanol mainly for export to South Africa regionally. In this regard, Africa must take careful decisions as the greening of the energy ladder campaigns particularly production of biofuels intensifies.

Other authors have shown that as more land is being given up for production of biofuels, food insecurity is likely to increase thereby putting many lives at risk due to increases of food prices caused by dwindling supplies (Langeveld, Dixon, van Keulen, & Quist-Wessel, 2013). Furthermore, there is a risk of having Africa as a producer of clean energy and exported to other territories outside the region. As the continent strategizes on becoming a leader in industries of the future, this could also be an opportunity where efficiency gains could be realised and beneficiation of biofuels could create more green jobs.

Observations have been made by a number of experts that importing already made products to Africa increases dependency on richer countries without necessarily solving the underlying problems facing the continent. Although Africa has the longest sunlight hours per day, reaching 14 hours per day in some areas, it is intriguing that research and development for solar based renewable energy is mainly established and aggressive in Germany and China. Again this repeats the ugly face of having Africa as a technology and therefore price taker instead of developing the technological skills which would reduce the production cost.

Clearly there is demand for energy in general and clean energy solutions are needed to bypass the economic growth and development as adopted by western countries in the industrial revolution. Following the Chinese trajectory of meeting the bottom line of providing 'energy first and cleaning it

later' as an overarching philosophy leading to more use of coal and diesel powered generators to generate electricity could be one of the considered short sighted policy areas aimed at supporting the ever rising demand for energy. One might argue that Africa's 3% contribution to total global greenhouse gas emissions is negligible for the continent to join the loud bandwagon advocating for environmental sustainability. However, two wrongs wouldn't really make a right; it would simply exacerbate the existing problem. In this regard, Africa in general and SADC in particular has the opportunity to be a leader in cleaning the environment by championing a sustainable use of energy resources.

The region has however put in place infrastructure development plans targeting the energy sector. To improve both generation capacity and interconnection networks to facilitate trading of energy, the member states have targeted many infrastructural projects. Through the '*Regional Infrastructure Development Plan*', the region has purposed to prioritise the interconnection of the three remaining countries to the regional grid to improve the supply of electricity. The petroleum sector is set to see more refineries, storage facilities and pipelines. Apart from infrastructure development aimed at expanding and improving the quantity and quality of energy supply, the booming infrastructure development in general also has a role to play especially in greening the energy ladder.

3.0. Energy in Infrastructure Development

Recently there have been strong indications pointing to the agreement that the African continent will be the next hub for economic activity. Infrastructure development is one such area where tremendous hive of activity could be expected to rise. The need for better roads, super highways, large shopping centres, office complexes and dwelling units will be high as the middle class will be expected to increase too.

It turns out that in the SADC region, biomass is the most common source of energy not only for households but also the construction industry. This poses a threat to the nature of infrastructure-led economic growth which might end up being environmentally unsustainable. For instance, for every 50,000 bricks that are needed for a construction of a standard sized home, at least 10 tons of firewood is required to bake them³. Figure 1 shows an oven that has been used firewood to bake bricks. The implication is that for every housing project taking place, there is a considerable amount of deforestation taking place leading to possible climate change consequences.

³ Information sourced from an interview with some brick moulding and baking 'experts' in Balaka District, Malawi. The bricks are moulded out of sticky clay soil and get manually baled in large ovens.

Figure 1 Bricks in an Oven already baked for construction



Source: Photo by Betchani Tchereni, 8th September 2014.

The construction industry is competing with households for the same biomass in order to stay alive. It is therefore a matter of urgency that environmentally friendly construction technologies be transferred from the developed areas such as South Africa to the less developed areas such as Mozambique and Malawi. The use of bricks made from cement and baked using electricity would go a long way to address deforestation in a country such as Malawi. This is a business opportunity as much as it is a sustainability venture. Through proper investment agreements and foreign direct investments from RSA to Malawi, Zambia, Mozambique and Zimbabwe, South Africa would be contributing to green growth through green infrastructure development.

This is another area where international trade can be important in greening the energy ladder and creating more green entrepreneurs within the Africa rise conversation. Socially responsible investment ventures should not only maximise profits but also provide a commodity that should improve the lives of the people. The provision of sustainable energy resources mustn't be championed by investors who consider Africa as a market place. There is therefore a great need to construct implement an Energy Trade Protocol that incorporates best practices in Renewable Energy Technologies (RETs).

Trade in Renewable Energy Technologies

While it is recognised that RETs cannot solve all of Africa's energy problems, RETs are still seen as having a significant unexploited potential to enable African countries to meet their growing energy requirements. Although used inefficiently and in many respects at a rate faster than replenishing, renewable energy is already the dominant source of energy for over 80% of households (Karekezi & Kithyoma, 2003). This implies that if properly harnessed, it could meet a significant proportion of energy demand from the industrial, agricultural, transport and commercial sub-sectors. Integrating all the types of renewable energy with localised and coordinated regional R&D would be the first stage to cut the costs and make the facilities available to everyone.

Where supply side neglects the role of R&D; efforts to green the economic growth path will not yield meaningful results. Owing to factors such as sensitivity and security of energy facilities, energy policy and legislation that are not converging; and protectionist trade policy in many parts of the continent; the penetration of RETs remains more of a dream than a depended upon venture. It is therefore imperative that the implementation of the SADC Energy Protocol be reaffirmed in earnest particularly in sharing skills expertise in RETs.

Although there has been recognition that they are important sources of energy for both rural and urban areas of the sub-Saharan Africa, RETs have attracted neither the requisite level of investment nor tangible policy and legislative commitment (Karekezi & Kithyoma, 2003). Furthermore, both national and international financial and skilling resources allocated to developing, adapting and disseminating RETs in the last two decades may appear substantial, the total amount is still insignificant compared to that allocated to the conventional energy sector (ibidi).

One therefore notes that the success of RETs in the region has been limited by a combination of both soft (policy) and hard (technical) factors which include: poor institutional framework and infrastructure; inadequate RET planning policies; lack of co-ordination and linkage in RETs programmes among member states of the region and development partners providing interventions in the sector; pricing distortions which have placed renewable energy at a disadvantage; high initial capital costs; weak dissemination strategies; lack of skilled manpower; poor baseline information; and, weak maintenance service and infrastructure.

4.0. Trade Barriers in Greening the Energy Ladder in SSA Region

The efforts of supplying energy facilities to the people of the SADC region face a number of challenges. In terms of adoption of renewable energy technologies, the region must deal with the following.

Policy and Legal Barriers

RETs cannot be successfully introduced in the region if governments are passive participants in the efforts to do so. Non-governmental organisations have been central in intervening to provide some pilot type of projects to smaller villages. What is required is a stronger government policy with a clear focus on RETs. Government policies are an important factor in terms of their ability to create an enabling environment for RETs dissemination and mobilising resources, as well as encouraging private sector investment (Karekezi & Kithyoma, 2003).

As a response to the energy crisis of the 1970s, most African countries established dedicated government departments responsible for energy and resources. However, as soon as some relief was reached after the end of the energy crisis of the 1970s, government department did not continue with further research to establish better and affordable alternative sources of energy. Unfortunately, once the energy crisis subsided, government support for energy development and RET activities diminished significantly. Now most of the remaining support is at rhetorical level.

Most governments do not have a clear-cut policy on the development and promotion of RETs, which continue to be undertaken within an energy planning and policy vacuum. In countries such as Malawi and Zambia, RETs are still considered as rural energy facilities leaving the urban centers as the focus of traditionally mainstream on-grid power supply. Consequently, RETs development follows an ad hoc path, with no clear link to national power master plans, which are rarely available or out of date (Karekezi, 1988).

This is better described in the following paragraph:

'A survey carried out in Botswana revealed that about 57% of the respondents had no knowledge of government policies designed to promote the use of RETs. In Malawi the policy vacuum has meant that the majority of RETs dissemination efforts have not only been ad hoc, but have operated largely as informal sector activities outside the framework of government machinery, thus failing to mobilise the fiscal support of the central government and its major donors. A study on wind energy undertaken in Kenya showed that Dutch aid officials would have been interested in financing wind projects if there was an official wind energy policy strongly supported by the Government' (IT Power, 1987 in (Karekezi & Kithyoma, 2003)).

Technical Barriers

RETs are green fields in their nature in the science, business and social arena. As such, the development and marketing of RETs requires special and relatively new skills. In general, the SSA region faces acute shortage of technical know-how of RETs in particular. Technical knowledge and special skills in all sorts of renewable energy technologies is important in order to accumulate a critical mass of professional African industrialists specialising in the design, production and marketing of RETs. It is therefore of significant importance to organise new training programmes through which skill transfers can happen across the region. It must be emphasised that the required technical know-how must encompass the whole value chain without emphasising on engineering alone.

Countries such as Zambia, Kenya and Malawi for instance have had to depend on spatial knowledge of NGOs to incorporate RETs agenda in their programmes. In Malawi, the Malawi Energy Regulatory Authority (MERA) has had no RETs expertise for over 10 years. Consequently, the RETs industry becomes poorly regulated without clear standards. As such it raises the risk of having information asymmetries leading to possible exploitation of consumers. This risk is particularly clear in rural areas where people do not have proper access to information. Unscrupulous traders have engaged in supplying Solar PVs for example that are substandard and unguaranteed and usually at higher than normal prices.

For the SMMEs sector, such skills are already a far-fetched thought. Mostly, they engage themselves in trading and installation of small systems at the household level using rudimentary electrical knowledge. In this sector, technical skills are largely mechanical. This may explain the low uptake of electrical RETs such as solar PV and wind generators (Tchereni, 2013; Karekezi & Kithyoma, 2003). The complex nature of these technologies coupled with the shortage of technical skill, result in the reliance of expatriates or individuals based in urban areas. The departure of the outsiders often leads to the demise of the RET projects. The dependency syndrome then would continue to exist in the region.

The SSA region in general and SADC in particular requires long-term renewable energy training programmes designed to develop a critical mass of locally-trained manpower with the requisite technical, economic and social-cultural skills. Skill transfer is at the ore of ensuring the success of RETs uptake in the region. Presently, the engineering and technical courses that are offered at institutions of higher learning provide little exposure to the technical details of alternative energy technologies. Radical and long-term changes in the curricula of existing colleges and universities could significantly increase the supply of skilled renewable energy engineers, policy analysts and technicians (Cassel, 2013; Kambanda, 2013; Muntschick, 2013).

'Both capacity and demand for local analytical expertise to provide comprehensive evaluations of available renewable energy resources and options for utilising them are needed in Africa. Non-partisan groups, such as NGOs and independent research institutes and networks are well placed for performing such studies. Fostering the development of human resources and

encouraging their use is a valuable area for investing donor support, as it directly equips recipient countries with tools for managing their resources on their own' (Karekezi & Kithyoma, 2003).

5.0. BILATERAL AND MULTILATERAL TRADE AGREEMENTS IN SADC

History of the creation and establishment of the SADC suggests that it was mainly born to tackle social political issues without necessarily bringing economic policy into the tables of the Heads of State. However, it soon materialised that for the objective of peace and stability to be realised, the economic bottom line needed to be addressed as a region. Soon, convergence of many factors ranging from macroeconomic to political indices became the subject of discussions. All economies were expected to grow by an average of 6% per annum if they were to eradicate poverty.

In the energy front, the SADC developed several policy documents that include the RISDP, Energy Protocol, Energy cooperating Policy and Strategy and the Activity Plan. These policies are outdated as they were developed before the year 2001. Their purpose was to harmonise national and regional policies and regulatory frameworks, to cooperate in energy development and trading through development of the necessary infrastructure, exploiting the abundant energy resources in the region, particularly hydropower and have co-ordinated planning and institutions. These instruments were all developed before 2001 and are thus outdated and require revision to cater for emerging paradigms of biofuels, energy efficiency and climate change.

6.0. The State of Energy Trade in SADC

Regional integration efforts by multilateral institutions focused on freeing up trade for the benefit of the world economies. For the World Trade Organisation (WTO), geography played a part in deciding some of its policies and trade platforms. South-South Trade deals were advocated by developing countries in the southern hemisphere of the world such as Brazil, South Africa and Mexico. It was believed that before deals should be clinched with first world nations such as UK and USA, it was imperative that the position and strength of the developing nations, most of whom are in the southern hemisphere, be made stronger.

Trade in goods and services was encouraged between and among the countries. Regional economic blocks such as SADC and COMESA were born to facilitate the process of easing the ways in which international trade was carried out. Energy, particularly modern facilities, became a need for each one of the nations.

The SSA is arguably one of the poorest regions of the world with poor infrastructure development. Although most countries in the region have poor supply of energy facilities, many of the countries have the potential to develop and supply even more power exceeding the required local demand. This then justifies the need for properly coordinated energy trade within the region.

Having an interconnected regional power grid has potential benefits which surpasses the risks. Better supply of power could be guaranteed in countries which are vulnerable to disturbances in transmission (Muntschick, 2013). In addition, having an integrated supply of power would lead to huge economies of scale which would smoothen the spiked supply. Where some countries have too much power, it could be sold to other countries which could be experiencing shortages in their supply side.

The generation of power in Africa came later than the discovery of electricity in the West. The colonisers of the continent needed light, heating and cooling systems that required modern electricity. As a result, in many parts of the continent such as Zimbabwe, Malawi, Kenya and South

Africa, small diesel powered generators were used to generate power for the rulers of the colonies. Each colony was independent in meeting their own power and like in developed countries, the generation was centralised to supply energy to centres of governance.

The first steps towards cleaner energy were at Kariba Dam in Zimbabwe and Zambia where the colonial government of both Northern and Southern Rhodesia purposed to generate and supply electricity to the seat of government. In Malawi, Nkula Falls was built again for the same purpose. In Mozambique, Coborabassa was constructed by the Portuguese to supply power to their colony. After the decolonisation wave in the 1960s, the

Power trading in Africa started in the 1950s, in the form of bilateral agreements between Democratic Republic of Congo and Zambia. This trade involved a 500 kV high voltage DC power supply that was 1,700 km in length. Many other agreements at the bilateral level continued to be signed between countries and sometimes focussing on particular sectors of the economy such as security, transport, agriculture and manufacturing. The Southern Africa Power Pool (SAPP) was the first formal multilateral energy consortium diplomatically agreed at a multilateral level in 1995. The innovations of SAPP were many all aimed at making energy available and affordable to inland member states of the SADC region. SAPP introduced the Short-Term-Energy Markets (STEM) in April 2001, which runs on daily and hourly contracts. This ignited the development of a more competitive energy market in the form of a Day-Ahead Market (DAM) which became operational in October 2009 (Muntschick, 2013; Kambanda, 2013).

SAPP was created by inland member states on 28th August 1995. The crucial purpose of the establishment of SAPP was to 'provide reliable and economical electricity to the consumers of each and every SAPP member'. In addition, SAPP was created to coordinate the energy policies of member states in the region. The coordination role expanded to include coordination of designing and construction of power plants for increased capacities; improve distribution of power by maintaining and extending the regional power grid and to create and harmonise regional power standards.

The following utilities are members of SAPP although some are not operational.

Table 1 Mmembers of Southern African Power Pool as of 2011

Country	national of utility	Status	Installed Capacity (MW)
Angola	Empresa Nacional de Electricidade (ENE)	non-operating	1187
Botswana	Botswana Power Corporation (BPC)	operating	202
DR Congo	Societe Nationale d'Electricite (SNEL)	operating	2442
Lesotho	Lesotho Electricity Company (LEC)	operating	72
Malawi	Electricity Supply Commission (ESCOM)	non-operating	287
Mozambique	Electricidade de Mozambique (EDM)	operating	233

Mozambique	Hidroelectrica de Cahora Bassa (HCB)	observer	2075
Namibia	Namibia Power Corporation (NamPower)	operating	393
South Africa	South Africa's Electricity Supply Commission (Eskom)	operating	44170
Swaziland	Swaziland Electricity Company (SEC)	operating	70
Tanzania	Tanzania Electricity Supply Company (Tanesco)	non-operating	1008
Zambia	Copperbelt Energy Corporation	independent	-80
Zambia	Zambia Electricity Supply Corporation (ZESCO)	operating	1812
Zimbabwe	Zimbabwe Electricity Supply Authority (ZESA)	operating	2045

Source: (Muntschick, 2013).

The non-operating countries signed the membership agreement although their own power grid was not yet connected to the regional or at least one member's grid. Those members, thus Angola, Malawi, and Tanzania participate in all activities of SAPP apart from the actual operations. Malawi signed an agreement with Mozambique recently and work is underway to connect the two grids. This will operationalise Malawi's membership to in the SAPP and hope to obtain the benefits of the pool. It is important to note that membership in SAPP is a reserve of the power utilities, whether private or governmental.

The SAPP is not a spate entity independent of SADC mother body. Its establishment compels it to comply with the SADC treaty and protocols governing the agenda of the region. The strategic responsibilities of overseeing policy are a reserve of SADC ministers of energy. The day-to-day management of SAPP is executed through the SADC secretariat.

In West Africa, member states of ECOWAS established the Western Africa Power Pool (WAPP) in 2001 again to promote energy trade between member countries. The difference with SAPP though is that in WAPP, the actual trading platform for energy is yet to begin. Mostly, although to a greater extent using or adopting rules in the WAPP platform, most of the energy trade between or among countries is undertaken at the bilateral level. The ambition of the updated WAPP 2011 Master Plan envisages energy deals that will help achieve the adequate energy trade (which includes a renewable energy proportion of 10%) by 2020 (Kambanda, 2013).

7.0. ENERGY AND GREEN GROWTH PROTOCOLS IN SADC

The Southern African Development Community Ministers of Minerals, Resources and Energy signed the SADC Protocol n Energy in 2006. The seven objectives of the protocol on energy are as ambitious as they are elusive. Through this protocol, bilateral and other multilateral agreements on energy production, trade, research, supply and use would be harmonised in a manner that benefits all member states. The training and development of human resources/skills in new and standardised

energy technologies would take a centre stage to ensure supply of reliable and sustainable energy sources.

In the field trip that was carried out in Malawi, interviews were arranged with three of experts in renewable energy policy in the country. The aim of the interviews was to have an understanding of what they believe to be the impediments of renewable energy trade within the SADC region. A number of points were raised and chief among them were the following:

- (a) Renewable energy trappers such as solar panels and wind turbines are not manufactured in any of the countries in the southern hemisphere. China and Germany dominates the market for renewable energy facilities.
- (b) Renewable energy is still regarded as a rural area solution to the extent that even in the national policy for energy, it is captured as a rural energy facility
- (c) There is a perception that renewable energy systems are expensive compared to
- (d) Renewable energy facilities are perceived as lacking to meet certain basic household uses particularly cooking
- (e) There is lack of expertise of people both in government and private sector to champion the development of renewable energy technologies.

The implication is that there is low penetration of RETs into the economies of SADC more so that energy policies are old and do not incorporate such matters. However, the formation of Sothern African Power Pool is an important step forward providing an opportunity through which not only the actual trade in power is made but also transfer of skills and expertise that would assist in improving the infiltration of RETs to other member states of the region.

8.0. Trade in Environmental/Green Commodities

In the continuing negotiations win the DOHAS Round, Paragraph 31(iii) calls for the reduction or elimination of tariff and non-tariff barriers to environmental goods and services where, it is expected, the global economy would benefit in trade volumes, clean environment and further development (World Trade Organisation, 2011). The stalling negotiations at the Doha Round have meant that the trajectory and achievements as should have been expected have been jeopardised. However, there have been efforts by likeminded groups of countries to come together and negotiate a trade pack to liberalise trade in green goods and services.

One such grouping of countries is the Asia-Pacific Economic Cooperation (APEC)⁴ which has committed to achieve global free trade in environmental goods (APEC, 2014). The grouping has listed 54 goods which have been classified as those which are from an industry devoted to solving, limiting or preventing environmental problems (Bucher, Drake-Brockman, Kasterine, & Sugathan, 2014). A careful consideration suggests that these goods e actually established environmental technologies which consist of renewable energy (15), environmental monitoring analysis (17), and environmental protection (21). Only 1 is in the subheading of environmental preferable products (Hammeren, 2014). What is important is that the APEC initiative is modelled after the Most Favoured Nation structure of trade negotiations without following any closed group make-up. The implications are important to the SADC where the member states are not constrained by the

⁴ APEC member states include United States; Australia; Brunei Darussalam; Canada; Chile; China; Hong Kong, China; Indonesia; Japan; Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; The Philippines; Russia; Singapore; Republic of Korea; Chinese Taipei; Thailand; and Viet Nam.

bilateral and regional trade agreements the benefits that will be enjoyed after the conclusion of the negotiations in APEC can spread to any member state of the WTO including non-members.

It is therefore of utmost importance for those charged with the design of trade policy in the SADC member states to have a clear understanding of the most important elements of the agreement when it is reached.

On the global scale, there has been more political commitment and ambition to lower trade tariffs on environmental goods and services. For instance the announcement by the US President, Barack Obama that the USA would enter into the APEC negotiation block for green commodities to improve the free trading in green commodities came as a breakthrough. Normal Trade remedies are counter-progress in the quest to reach a free-trade regime in environmental goods.

Africa therefore must avoid the imposition of trade remedies on environmental goods and services. More so that there is more of importation of these goods and services than exportation, and faced with energy poverty that is highest among the poor countries, the products must be allowed to be traded without any special barriers.

The SADC region is yet to join the discussions at the regional level. It has however taken part in the negotiations at the WTO level which tries to widen the sustainability debate to more goods and services.

9.0. Convergences in the Energy Policies – A Green Economy Framework

Manoharan et al (2014) argue that for the SSA, there are a number of problems leading to poor modern energy access. For the case of Malawi, Tchereni (2013) shows that apart from awareness of the existence of renewable energy resources and their ability to provide equally enough power for an average household, there is also poor policy framework that excludes renewable energy. In Africa, renewable energy is regarded as inferior and therefore mainly seen as a product for the rural areas.

A green economy framework would encompass a number of areas through which governments would engage in planning for policy and projects.

Build Local and Regional Demand (Green Savings) – through the Energy Protocol, SADC member states agree that greening the energy ladder is the future of energy for the region's sustainability. However, without demand for alternative sources of energy, all the policy efforts would be in vain. This is where policies, consumer incentives, investments and behaviour changes to build demand for sustainable practices, products and services must be devised.

In South Africa for example, the electricity credits refunds which accrue to customers using alternative sources of energy provides incentives for people to migrate or at least adapt an energy mix even at the household level. In Malawi, Kenya and Tanzania; imports of alternative energy facilities are allowed to be duty free more so if they are clean resources.

Strengthen Local and Regional Supply (Green Opportunities) – Whilst in the past renewable energy facilities were developed for idealism, it should be the case that today it is a money spinner also. In that way entrepreneurs will be attracted into the industry and financing and investment will not be scarce. The projects have been disseminated as interventions by NGOs for the most part of Africa

which has made the middle class not interested. With a clear knowledge of the abilities of RETs, and the potential buyers available in all the SADC region, investors stand a chance to make more money. Therefore supporting the creation, development and attraction of sustainable businesses and clusters must be the aim of governments throughout the region.

In addition, governments must support investment ideas in green fields of green energy through loanable funds, markets and policy. Where the green energy markets are not hostile, with relatively easy entry and exit, more and more investors will be attracted to participate in the industry. FDI that aims at establishing manufacturing and maintenance plants in the host country must be encouraged more so that they would introduce new jobs.

Engage People in the Sustainable Economy (Green Talent) – long-term strategies should include the creation of a critical mass of expertise of people who can be trusted to be gurus in the industry. In addition, public discourse, training, education, and orientation must include RETs. .

10.0. Recommendations and Policy Options

As a recommendation, this study has found that although trade, industrial and environmental policies in the SSA are by far well advanced and encompassing, trade policy itself is not overtly clear about the need to address energy trade. Renewable energy must be incorporated as an important commodity needing clear trade policy that is specifically addressed at both bilateral and multilateral policy level.

Further, living everything to the devices of the SAPP as the only platform on which southern African nations will deliberate and decide upon matters of energy is tantamount to short-termism and temporal reliefs. The future for green growth lies in aggressive adoption of green energy sourced from renewable resources. As such it is imperative that SSA governments must clearly address the manufacturing, distribution, and technical know-how of all matters related to renewables.

In order to boost energy trade in the SSA region, the following needs to be done:

- Mobilize investments for the physical intra-regional infrastructure. This would include strategizing the mobilization of domestic resources. Some countries and RECs have already started considering infrastructure bonds. The African Development Bank has also appealed African countries to use Central Bank reserves for infrastructure development. There is also an emerging idea of using pension funds (Kambanda, 2013).
- Conducive legal and regulatory framework for the participation of the private sector in the industry. Property rights, copy right protection, development of standards and encouragement of participation must be in place. This should also include removal of inefficient red tape whenever a new project is proposed.
- Continued strengthening of the institutional capacity and skills of the power pools and directorates in charge of energy in the RECs. A certain focus should be paid to enhancing the capacity and skills for structuring and negotiating power deals with the private sector, e.g. PPA (Power Purchase Agreements).

In addition, it is important to improve energy security which is in a poor state. Many member states of the SADC region do not have properly secured energy facilities to the extent that other nationals do not want to expose their own facilities by partnering with those unsecured plants.

Africa must stop relying on overseas partners in developing energy projects. The SAPP gives the opportunity for Africa to independently develop a safe, secure and tradable power market from

which independence can be guaranteed. With a self-developed energy facility for the region, the advancement of knowledge and innovations relevant to the market conditions will be easier.

Bibliography

- Africa Progress Panel. (2013). *Africa Progress Report 2013: Equity in Extractives - Stewarding Africa's Natural Resources for All*. Geneva: The African Progress Panel.
- African Centre for Economic Transformation (ACET). (2014). *2014 Africa Transformation Report*. ACCRA, GHANA: ACET.
- Alves, P., Drapar, P., & Khumalo, N. (2009). *Africa's Challenges in International Trade and Regional Integration: What Role for Europe?* Johannesburg: South African Institute of International Affairs.
- APEC. (2014, January). Joint Statement Regarding Trade in Environmental Goods. Davos: WTO.
- Belward, A., Bisselink, B., Bodis, K., Brink, A., Dallemand, J. F., De Roo, A., et al. (2011). *Renewable Energies in Africa*. (F. Monforti, Ed.) Luxembourg: European Commission's Joint Research Center.
- Bucher, H., Drake-Brockman, J., Kasterine, A., & Sugathan, M. (2014). Trade in Environmental Goods and Services: Opportunities and Challenges. *International Trade Center Technical Paper*.
- Cassel, M. (2013). *African Renewable Energy Review 07/2013*. Pretoria: NEDBANK Capital.
- Davidson, O., Chenene, M., Kituyi, E., Nkomo, J., Turner, C., & Sebitosi, B. (2007). *Sustainable Energy in sub-Saharan Africa*. Seychelles: The International Council for Science.
- Hammeren, L. (2014). *Sustainable Development and Liberalisation of Trade in Environmental Goods: An Analysis of the APEC and WTO Initiatives*. Department of Industrial Economics and Technology. Trondheim: Norwegian University of Science and Technology.
- International Energy Agency. (2012). *World Energy Outlook 2012*. London: IEA.
- Johnson, F. J., Chen, Y., & Zuzarte, F. (2008, June 5). Biofuels, land use, and sustainable development in Asia and Africa. *Environment and Poverty Times No 5*.
- Kambanda, C. (2013, July 10). *African Development Bank Group*. Retrieved September 14, 2014, from <http://www.afdb.org/en/blogs/integrating-africa/post/power-trade-in-africa-and-the-role-of-power-pools-12101/>: <http://www.afdb.org/en/blogs/integrating-africa/post/power-trade-in-africa-and-the-role-of-power-pools-12101/>
- Karekezi, S., & Kithyoma, W. (2003). Renewable Energy Development. *Renewable Energy in Africa: Prospects and Limits - Workshop for African Energy Experts on Operationalising the NEPAD Energy Initiative* (pp. 1-26). Dakar: Republic of Senegal and United Nations.
- Lall, S. (2004). Selective Industrial and Trade Policies in Developing Countries: Theoretical and Empirical Issues. In C. Soludo, O. Ogbu, & H.-J. Chang (Eds.), *The politics of Trade and*

- Industrial Policy in Africa: Forced Consensus?* (pp. 75-109). Trenton: International Development Research Centre (IDRC).
- Langeveld, J. W., Dixon, J., van Keulen, H., & Quist-Wessel, P. M. (2013). *Analysing the Effect of Biofuel Expansion on Land Use in Major Producing Countries: Evidence of Increased Multiple Cropping*. Wageningen: Biomass Research.
- Maupin, A. (2013, August). Building a Regional Electricity Market: SAPP Challenges. *PERISA Case Study No 4: Public Goods*.
- Muntschick, J. (2013). Regional Energy Cooperation in SADC: is the Southern African Power Pool currently powered by External Funding? In A. du Pisan, G. Erasmus, & T. Hartzenberg, *Monitoring Regional Integration in Southern Africa: Year Book 2012* (pp. 113 - 139). Cape Town: Trade Law Center and the Konrad-Adenauer-Stiftung.
- Nampoothiri, M., & Manoharan, H. (2013). *International Trade and Access to Sustainable Energy: Lessons from Country Experiences*. Geneva: International Centre for Trade and Sustainable Development (ICTSD).
- O'Leary, T. D., Charpentier, J.-P., & Minogue, D. (1998, June). Promoting Regional Power Trade — The Southern African Power Pool. *Public Policy for the Private Sector*.
- Shikwati, J. (2006). *The Future of Africa in the World*. Nairobi: Inter Region Economic Network.
- Soludo, C. C., & Ogbu, O. (2004). The Politics of Trade Policy in Africa. In C. Soludo, O. Ogbu, & H.-J. Chang (Eds.), *The Politics of Trade and Industrial Policy in Africa: Forced Consensus?* (pp. 111-134). Trenton: International Development Research Centre (IDRC).
- Southern African Development Community (SADC). (2012). *Regional Infrastructure Development Master Plan*. Gaborone: SADC.
- Tchereni, B. H. (2013). A Microeconomic Analysis of Energy choice behaviour in Sout Lunzu Township, Malawi. *Mediterranean Journal of Social science*, 4(6).
- Viljoen, W. (2013). How can Aid for Trade facilitate Green Growth and Sustainable Development in Southern and Eastern Africa? In A. du Pisan, G. Erasmus, & T. Hartzenberg, *Monitoring Regional Integration in Southern Africa: Year Book 2012* (pp. 60 - 98). Cape Town, South Africa: Trade Law Center and the Konrad-Adenauer-Stiftung.
- Wentworth, L. (2014, June). Creating incentives for green economic growth: Green energy in South Africa. *Occasional Paper 193*. Johannesburg, Gauteng, South Africa: South African Institute of International Affairs.
- World Trade Organisation. (2011). *Harnessing Trade for Sustainable Development and a Green Economy*. Geneva: WTO.
- Zhou, P. P. (2012). *The SADC Regional Infrastructure Master Plan: Energy Sector Plan*. Gaborone, Botswana: Southern African Development Community Secretariat.

