

SADC REGIONAL ECONOMIC INTEGRATION IN THE ENERGY INDUSTRY

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INTRODUCTION

Regional cooperation in the energy sector is increasingly becoming a common phenomenon in every part of the world. From the Strategy for Regional Co-operation in the Energy Sector of the Central Asia Regional Economic Cooperation (CAREC) countries, the Summit of the Americas on Regional Energy Co-operation, to the Energy Community between the European Union (EU) and South Eastern Europe, regional cooperation in the critical energy sector is now recognised as central to the attainment of the vision for regional energy security. The fundamental objective of most regional integration blocs is to promote sub-regional energy cooperation and integration.

Regional economic blocs provide a framework for cooperative approaches

in the development of energy infrastructure and the creation of larger and more efficient energy markets through such strategies as energy pooling and cross-border energy flows (UNECA, 2009). The drive towards regional energy cooperation is achieved by means of the development of the region's energy infrastructure, institutions and stronger integration of regional energy markets. These strategies are designed to reduce the cost of energy supply by means of economies of scale of sub-regional energy supply systems. In the process, the reliability and security of regional energy supply is assured.

Energy resources are the lifeblood of thriving economies (Ali, 2005). The balance between supply and demand of energy has a significant impact on economic policy, business and households; given that energy is a critical input in the pro-

duction processes of economies. Energy provides the fuel that drives transportation systems, heats homes and offices and powers factories (Bernanke, 2006). Developments in the energy markets will continue to be crucial in determining the long-term health of many countries. Hence, there is a relationship between energy and economic development.

The Southern African Development Committee (SADC) was originally formed in 1980 but changed its name to SADC in 1992. The regional trading bloc has 15 member states and had a population of 260 million people and a combined GDP of US\$470 billion at the end of 2008. Energy is one of the many sectoral mandates for SADC. The overriding objective of the SADC Energy Sector is to ensure the availability of sufficient, reliable, low cost energy services in the region that will contribute to the attainment of economic efficiency and ultimately, the eradication of poverty (SADC, 2010).

The purpose of this paper is two-fold: first, to examine the major regional economic integration programmes and initiatives undertaken by SADC among its member states in the energy sector, and secondly, to obtain some insights on achievements made in the sector to date. The study concentrates on programmes, activities and initiatives carried out in the last decade, 1999–2009. The impact of energy consumption on the economy remains a fascinating and absorbing subject to governments, professionals and academics.

The paper is organised in five sections. The first section introduces the study, providing background information on regional cooperation in energy and SADC. The second section examines the role of energy in economic

development. The third section investigates the significance of regional economic cooperation in energy, integration programmes and initiatives within the energy sector in SADC. The fourth section uses various energy sector data to illustrate the level of progress made in the sector, attributing progress achieved to SADC integration efforts. The fifth section concludes the paper.

1. ENERGY AND ECONOMIC DEVELOPMENT

There are abundant sources of energy in the world. These include thermal or heat (geothermal and ocean thermal reservoirs), chemical (fossil fuels – coal, oil, natural gas, peat; biomass – wood, agricultural residues, etc.), potential (water at a certain height), kinetic (wind, waves), radiation (sun/light), nuclear (fusion and fission), energy, etc. Similarly, Africa has an abundance of energy resources in the form of oil, natural resources, coal, hydroelectricity, biomass and other renewable-energy sources.

Energy sources can be categorised as either renewable (e.g. solar energy, wind, geothermal energy, biomass and hydropower) or non-renewable (e.g. fossil fuels – coal, natural gas and petroleum), depending on whether the energy source is always available or can be used up. Another classification of energy sources is whether they are commercial or non-commercial, depending on how and where the energy is used. Coal, lignite, oil, natural gas, electricity and nuclear sources constitute commercial sources, while fuel wood, animal waste and agricultural residue form the traditional or non-commercial sources of energy.

The existing literature on energy and development shows that energy is an important component of broader economic development (Toman and Jemelkova, 2002). Several studies (Glasure, 2002; Oh and Lee, 2004; Stern and Cleveland, 2004) covering different regions of the world but focusing on the causal directions between energy consumption and economic growth confirm that a causal relationship does exist between energy consumption and economic growth. There is also a realisation that the full economic development potential of developing countries depends on the elimination of existing energy supply constraints in those countries. This is in line with the assertion by Stern (1997), that energy is an important factor of production.

Covering the period 1961 to 1990, Glasure (2002) studied the causality between economic growth and energy consumption in South Korea. He provides evidence to support a bi-directional causation, and the oil price is found to have the most significant impact on GDP and energy use. Oh and Lee (2004) also study the relationship between these variables in South Korea, instead covering the period 1970 to 1999. They provide evidence to support a bi-directional causation between energy and GDP. These studies support the view that energy infrastructure plays a pivotal role in economic development (Stern and Cleveland, 2004).

The New York State Energy Research and Development Authority contends that policies that promote a secure, competitive and fairly priced energy supply will help attract, retain and expand businesses. These policies include reducing energy costs to consumers, improving energy infrastructure

and consequently, the reliability of energy supply. Promoting cost-effective energy-efficiency strategies, renewable energy resource development and alternative-fuelled vehicles stimulate job creation (NYSERDA, 2008). *Clearly, energy has become a critical cog in the production processes of economies.*

2. REGIONAL ECONOMIC COOPERATION

2.1. The Benefits of Economic Cooperation

Regional economic cooperation is an essential vehicle for raising the development of member states, to enable them to realise their full economic potential. The trend towards regionalism occurs as markets become more integrated on a regional and global basis. Padoa-Schioppa (2004) argues that regional integration plays an important role in promoting the growth, stability and the peaceful coexistence of nations around the world. Some major benefits of trade are outlined below.

a. Stimulating Trade

Regional integration results in intra-regional tariff reductions, which in turn lowers the prices of imported goods from the region, stimulating trade. Competition from intra-regional trade liberalisation results in increased output and employment as tariffs come down.

b. Creation of a more attractive investment climate

Since regional integration provides a larger market, there is stimulation of

Foreign Direct Investment (FDI) and domestic investment leading to higher returns on capital (Krugman, 1990). Increased FDI triggers a host of positive spillovers in the entire economy in terms of innovation, technology transfer, employment and other effects across the whole economy. In other words, regional economic integration creates economies of scale. Rather than look at a small country like Lesotho, a company intending to invest in Lesotho may be attracted when it considers the entire SADC as a single but enlarged market, rather than Lesotho alone. Thus, the entire SADC region creates a more attractive investment climate.

c. Increased regional security

Around the world, evidence abounds that regional integration has been instrumental in promoting stability and peaceful relations among nations. Working together and reaching decisions by consensus goes a long way in fostering a spirit of togetherness and increasing regional stability. Membership of regional trading blocs link countries in a network of positive interactions and mutual interdependency. This situation is likely to build trust and reduce the risk of tension between nations (Polachek, 1992).

d. Collective bargaining power

Regional economic integration increases the bargaining power of nations. Member states are able to speak with one voice in negotiations and this improves their economies' effective participation in the global economy. Regional blocs enable countries to coordinate their positions, in key multilateral trade ne-

gotiations such as the WTO, providing enhanced visibility and consequently, robust collective bargaining power. This argument is especially relevant for small and poor countries in SADC.

2. 2. Regional Cooperation in Energy

Several factors are driving the move towards regional energy cooperation. These include the uneven distribution of energy resources among member countries, the need to optimise existing energy interrelationships, the achievement of least-cost solutions to energy constraints and the rising global energy prices which boosts the attractiveness of large hydropower project options (CAREC, 2008). Energy infrastructure is therefore a key pillar supporting the participating countries' drive for development through regional cooperation.

Regional trading blocs provide a framework for cooperative approaches to the development of energy infrastructure and the creation of larger, more efficient energy markets. Regional energy cooperation benefits from economies of scale, a critical mass of consumers and an increase in the reliability of local energy resources. Consequently, most regional trading blocs are striving to promote sub-regional cooperation and integration through energy pooling and cross-border energy flows. Regional cooperation in energy also offers opportunities for the efficient utilisation of resources (Tian, 2009).

In order to enhance development in the energy sector, regional energy cooperation focuses on a number of crucial policy areas. Depending on region, these include the financial viability of energy entities to enhance the sustain-

nability of energy supply and services. Another focus area is sector restructuring and commercialisation to enable energy utilities to run along business lines. Energy sector regulation promotes private sector participation and ensures that the competitive playground is even to all industry players. The formation of regional energy power pools is another principal focus area and aims to increase the reliability of energy supply services.

2. 3. Energy Cooperation in SADC

The SADC region is experiencing an energy supply deficit aggravated by an economic growth rate of more than 5% in most member states and the establishment of new mining companies with significant energy requirements. In addition, most utilities are not viable—the cost of generation in most cases is below the selling price. There has also been inadequate investment in generation and transmission infrastructure over the last 20 years. As of February 2008, the combined electricity demand for SADC stood at 47,067MW versus available capacity of 43,518MW, showing a regional deficit of 8% (SADC Today, 2008). The regional bloc is plagued by low levels of rural electrification except for Mauritius and South Africa.

SADC cooperates in matters of Energy through the SADC Energy sector which is run through the Directorate of Infrastructure and Services. The overall objective of the SADC Energy sector is to ensure the availability of sufficient, reliable, least cost energy services that will assist member states in the attainment of economic efficiency and the eradication of poverty whilst ensuring the environmentally sustainable use of

energy resources. The SADC Energy Sector has a number of key priorities in the region which include overcoming the diminished SADC Power surplus capacity, monitor and ensure the timely implementation of SADC projects, monitor and provide policy guidance for the Southern African Power Pool (SAPP) and the Regional Electricity Regulators Association (RERA) and coordinate the activities of the Regional Biofuels Task Force (Motlhatlhedhi, 2009).

Consequently, SADC has been working to harmonise national and regional energy policies, strategies and programmes on matters of common interest among members, based on the principles of equity, balance and mutual benefit. Member states have been cooperating in the development of energy and energy pooling to ensure security and reliability of energy supply in the several sub-sectors: wood fuel, petroleum and natural gas, electricity, coal, new and renewable energy sources, energy efficiency and conservation. SADC also promotes the joint development of human resources and organisational capacity building in the energy sector and also co-operates in the research, development, adaptation, dissemination and transfer of low-cost energy technologies (SADC, 2010).

2. 4. SADC Cooperation Programmes and Initiatives

SADC has been moving towards regional integration through a range of cooperation initiatives. A survey of the major SADC cooperation initiatives in energy, progress made and challenges encountered to date are presented below along with cooperation in energy projects.

2. 4. 1. *A Survey of Sadc Cooperation Frameworks in Energy*

a) The Regional Electricity Regulatory Association (RERA)

The Regional Electricity Regulators Association of Southern Africa (RERA) was established by SADC as a formal association of electricity regulators in Maseru, Lesotho in July 2002. The RERA Secretariat only became fully functional in 2005. RERA's mission is to facilitate harmonisation of regulatory policies, legislation, standards and practices and to be a platform for effective cooperation among energy regulators within SADC. RERA membership is open to electricity supply industry regulatory agencies in each SADC member state. There has been some positive movement in the areas of harmonisation of regulatory policies, legislation and standards within SADC. Although the number of RERA membership has risen from 4 to 9 from 2005 to 2008, progress made by RERA has been modest. However, at the national level, the body has made little headway in the privatisation of monopoly energy procurement and power generation utilities. In the entire SADC, no member state has fully unbundled or liberalised an electricity power generation utility. The oversight role of most energy regulators has been weak and ineffective. Source: RERA (2010); Sichone (2009)

b) The SADC Protocol on Energy

SADC countries signed the Energy Protocol in August 1996, although it only took effect in April 1998. The protocol recognises that energy problems are common within the region and that

member states may benefit from cross-border cooperation in the energy sector. Primarily, the protocol seeks the harmonisation of national and regional energy policies; fostering co-operation in the development and utilisation of energy and energy pooling to ensure security and reliability of energy supply. In addition, the protocol also seeks the promotion of joint development of human resources and organisational capacity building in the energy sector. Despite the fact that SADC governments signed and ratified the SADC Energy Protocol, there is evidence that its provisions have not been adequately implemented. Severe power shortages abound in most member states and existing energy infrastructure is old, in urgent need of refurbishment and inadequate. For example only 16% of the households are connected to the electricity grid in Lesotho. Despite huge energy potential in the region, most of this potential remains untapped. The privatisation of energy monopolies in SADC is progressing very slowly while the growth in electricity generation has been modest at best. Efforts to diversify from the conventional energy sources to the more abundant renewable and other nonconventional sources (e.g. solar, wind, gas etc) has been unsatisfactory. Source: SADC (2010)

2. 4. 2. *Key SADC Power Infrastructure Projects*

a) The Western Corridor Project (WESTCOR)

WESTCOR is a SADC project conceived through the combined initiative of the SADC Secretariat and the power utilities of Angola, Botswana,

Democratic Republic of Congo (DRC), Namibia and the Republic of South Africa in 1996. The Headquarters of the WESTCOR is in Gaborone, Botswana. The aim of the project is to harness the large water resources of the Congo River at Inga in order to produce and supply electric power, initially for the five countries involved but ultimately to the whole SADC sub-region. Initially, the project was aimed at the construction of a 3,500MW hydroelectric dam, a transmission line and a telecommunications line at a total cost of US\$7 billion. Latest reports suggest that WESTCOR has pulled out of the Inga III power project and is currently shutting down the Botswana office, handing down massive losses to the sponsors of the project. This occurred after the DRC government decided to go it alone with a set of different partners outside the SADC region, ostensibly because of chronic delays in the implementation of the power project. This is a sad reflection of regional cooperation in SADC. Source: SADC, 2008, *Afrique En Ligne* (2009)

b) The Short Term Energy Market (STEM) / (DAM)

In 2001, a Short Term Energy Market (STEM) was operationalised. The purpose of STEM was to facilitate contracts of periods of up to a month for the supply of electrical energy to individual customers and utilities. Nine countries in SADC were participating with the exception of Angola, Malawi and Tanzania at one time. From January 2004, the SAPP started the development of a competitive electricity market for the SADC region. The new market is in the form of a Day-Ahead Mar-

ket (DAM). The Day Ahead Market (DAM) was opened in February 2008 for market trials. The following utilities BPC, EdM, Eskom, CEC, NamPower, ZESA and ZESCO have indicated an appetite and have no doubt that they will face up to the challenges to trade in the Day Ahead Market. These operators are almost half of SAPP membership. With the severe power shortages in the region and the difficulties of some members face in settling their bills on time, DAM faces a number of tough challenges. Source: SAPP (2010)

c) The Southern Africa Power Pool (SAPP)

SADC pioneered the establishment of sub regional power pools when 12 of its member States, excluding Madagascar and Mauritius created the Southern African Power Pool (SAPP) in August 1995. The power pool provides a framework for regional electricity trading and coordination. It is funded by subscriptions paid by member utilities. SAPP serves as a model for the establishment of free trade zones for energy in other parts of Africa. SAPP has scored some notable successes by carrying out a number of successful electricity generation projects, refurbishment of power stations and implementing a programme of managing demand. Source: SAPP (2010)

d) Programme for Biomass Energy Conservation (ProBec)

ProBec deals with basic energy services. The organisation's Steering Committee met in December 2008. Over 70% of the people in the rural areas depend

on biomass for cooking and heating. It is expected that in future these people will be able to move up the energy ladder. In the meantime while these people are dependent on biomass, provision has to be made so they can consume the limited biomass resources more efficiently. This is particularly so because poor combustion also causes eye diseases. The project aims to improve energy supply to about 600,000 people in SADC countries by enabling them to fulfill the energy needs of households and small-scale industries in a socially and environmentally sustainable manner (SADC Energy Sector, 2008). There has been some limited progress on this project but like most SADC projects it has been undermined by severe funding constraints. Source: SADC Energy Sector (2008)

3. THE ENERGY SECTOR IN SADC: SOME MARGINAL PROGRESS MADE

The population, economic growth, energy production and consumption vary markedly among SADC member states (table 3.1). For example, the major energy producers in SADC are regional economic power South Africa and oil-producing Angola, churning out respectively 162.95 and 105.84 Million tonnes of oil equivalent (Mtoe)*. South Africa produces 247 Mtoe of coal, an important ingredient in the 241 Mtoe of fossil electricity the country generates. Angola produces 92 Mtoe of crude oil. Angola, South Africa, Mozambique and the DRC are net exporters of energy in SADC.

SADC member states that are also members of the Southern African Power Pool (SAPP) had an installed capacity of

56,000MW, with 87% available capacity as at April 2009 (table 3.2). Compared against the maximum peak demand of 44,000MW, there is surplus electricity generation in the region.

An analysis of the breakdown of installed generation capacity against peak demand by country shows that Mozambique, the DRC and South Africa have the largest installed capacity at 2,308MW, 2,442MW and 44,170MW respectively (table 3.2). On the other hand, Zimbabwe, Zambia and South Africa have the largest peak demand at 1,397MW, 1,604MW and 35,959MW.

To understand this situation better, it is important to take a historical perspective of electricity generation and consumption in the region. Figure 1 shows that in 2004, the installed capacity was almost on par with the peak demand. However, by 2009 the installed capacity had risen almost 30% from 40,000MW to 56,000MW while peak demand rose only 5% from 41,000MW to 43,000MW. Although 87% of the installed capacity is available, the situation is deemed healthy. In view of the fact that SADC members are signatories to the SADC Energy Protocol and in view of the efforts that SAPP is making, part of this progress is attributable to SADC regional cooperation efforts.

The composition of the electricity generation mix is important because some electricity generation technologies are more efficient than others while some are more expensive to buy or maintain than others. There are five methods of producing electric power in SADC region—hydro, coal, nuclear, OCGT and the distillate method. By far the largest method of electricity production in SADC is hydro electric power generation account-

Table 3.1: Selected Energy Indicators in SADC

Country	Population (millions) 2008	GDP Annual growth rate % 2008	Energy Sources (various) produced Mtoe	Net energy imports Mtoe	Electricity consumption TWh
Angola	18.02	13.18	105.84	-93.70	3.41
Botswana	1.92	2.95	1.00	1.13	2.89
Congo (Dem. Rep)	62.26	6.20	22.66	-0.38	6.11
Mozambique	22.38	6.79	11.46	-2.07	10.33
Namibia	2.13	2.93	0.32	1.43	3.83
South Africa	48.69	3.06	162.95	-17.44	232.23
Tanzania	42.48	7.46	17.47	1.62	3.56
Zambia	12.62	6.00	6.79	0.61	7.60
Zimbabwe	12.46	n/a	8.53	0.97	12.74

Source: OECD/IEA; World Bank 2010

* The tone of oil equivalent is a unit of energy used for large amounts of any type of energy.



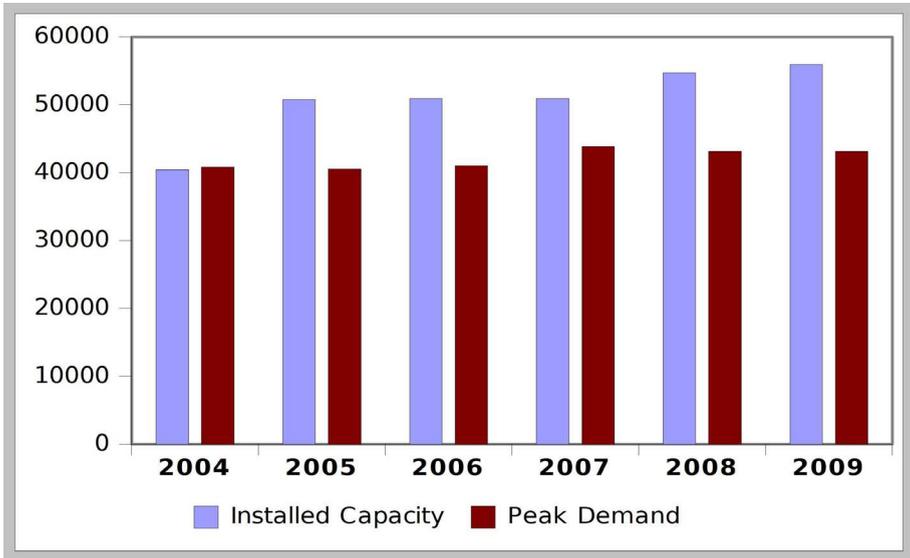
Table 4.2: Electric Power Generation and Demand by Country in SADC*, 2009

Country	Utility	Installed capacity MW	Available capacity MW	Maximum demand MW	Capacity surplus or shortage
Angola	ENE	1,187	930	668	578
Botswana	BPC	132	90	503	-413
Congo (Dem. Rep)	SNEL	2,442	1,170	1,028	142
Lesotho	LEC	72	70	108	-38
Malawi	ESCOM	287	267	260	7
Mozambique	EDM	233	174	416	-242
Mozambique	HCB	2,075	2,075	416	-
Namibia	NamPower	393	360	430	-70
South Africa	ESKOM	44,170	40,483	35,959	4,524
Swaziland	SEC	70.6	70	200	-130
Tanzania	TANESCO	1,008	680	694	-14
Zambia	ZESCO	1,814	1,200	1,604	-404
Zimbabwe	ZESA	2,045	1,080	1,397	-317
TOTAL	-	55,929	48,649	43,683	3,623

*Only includes members of the Southern African Power Pool (SAPP)

Source: SAPP, 2010

Figure 1
SADC Electricity Generation and Peak Demand in MW (2004-2009)



Source: SAPP (2010)

ting for 67% of all electricity generated, followed by coal at 26%, OCGT at 5% and others at 3% (table 3.4). The distillate method and the nuclear method account for the balance. South Africa is the only country in SADC which produces electricity using nuclear technology.

The process of electricity reforms normally begins with the repeal of legislation abolishing the monopoly situation in the sector, the establishment of an independent regulator and the introduction of competition in the sector. Invariably, the purpose of reforms is the need to attract private investment in the industry with a view to broadening electricity access to domestic consumers. To date, no SADC country has privatised state-owned electricity assets.

Table 3.5 shows the status of reforms in the electric sector in SADC. Al-

though SADC is dominated by state owned utilities, all countries in the bloc have implemented some form of sector reforms, especially new sector legislation. The majority of the countries have introduced some form of regulatory oversight. Ten SADC countries have established an energy regulatory body, responsible for granting licenses. However, measured against the expectations of the SADC Energy protocol of 1996, progress is minimal.

CONCLUSION AND EMERGING PERSPECTIVES

From cross-border energy trade through the DAM vehicle, joint infrastructure development of projects through SAPP, to the development of

Table 3.4: Ratio of electric generation methods by country

Country	Utility	Hydro energy %	Coal %	OCGT	Other
Angola	ENE	76	8	16	0
Botswana	BPC	0	100	0	0
Congo (Dem. Rep)	SNEL	100	0	0	0
Lesotho	LEC	100	0	0	0
Malawi	ESCOM	100	0	0	0
Mozambique	EDM	91	0	0	9
Namibia	NamPower	61	33	0	6
South Africa	ESKOM	5	86	0	9
Swaziland	SEC	82	18	0	0
Tanzania	TANESCO	50	0	43	7
Zambia	ZESCO	99	0	0	1
Zimbabwe	ZESA	39	61	0	0
Average	-	66.92	25.50	4.92	2.67

Source: SAPP (2010)

common regulatory policy frameworks through RERA, cooperation in the region with a view to enhancing reliability and security of energy supply has been set in motion. Most countries have now repealed legislation abolishing the monopoly situation in the sector and are moving towards the establishment of an independent regulator, laying the framework for the introduction of competition in the sector. Through the process of regional sector integration, SADC is providing the appropriate framework for cooperative approaches for the growth of energy infrastructure and promoting inter-country energy exchange.

However progress on SADC cooperation frameworks has been unsatisfactory. Evidence abounds that the provisions of the SADC Energy Protocol as outlined in Section 3.4, has not been adequately implemented in terms of its provisions. Chronic power shortages and blackouts abound in most member states and the existing energy infrastructure is old, inadequate and in need of urgent refurbishment, more than fourteen years after the SADC Energy Protocol was conceived. In addition, most power utilities in SADC remain predominantly state owned utilities with a market structure of vertically integrated monopolies.

Table 3.5: Status of reforms in SADC countries

Country	Sector Privatised?	Number of Power Operators	Sector Regulatory Authority
Angola	No	1	IRSE
Botswana	No	1	n/a
Congo (Dem. Rep.)	No	1	n/a
Lesotho	No	2	LEA
Madagascar	No	1	n/a
Malawi	No	1	MERA
Mauritius	No	1	n/a
Mozambique	No	2	CNELEC
Namibia	No	1	ECB
Seychelles	No	1	n/a
South Africa	No	1	NERSA
Swaziland	No	1	n/a
Tanzania	No	1	EWURA
Zambia	No	1	ERB
Zimbabwe	No	1	ZERC
Total	-	17	

Source: RERA, 2010

Implementation of projects has equally been very slow and disappointing in many instances. The future of energy supply that looked assured through a series of large investments projects such as the massive hydroelectric project, Inga 3 in the DRC look dashed. Disagreements over the WESTCOR partners suggest that the project may be dead. ProBec is experiencing significant financing difficulties to make any

meaningful impact. The financial crisis of 2007 to 2009 diverted attention away from energy matters to issues of food and poverty.

A closer look at cooperation frameworks in energy and power infrastructure projects suggests that SADC faces major implementation problems. The first is political will; it is always not available to drive projects. The WESTCOR is a case in point. The second pro-

blem relates to financing. Some of the projects require significant amounts of money to implement. Although donors do occasionally chip in, this is not always the case. The continued flight of well educated and experienced experts from some SADC member states has created skills shortfalls that are affecting some of these projects.

There is still a long way to go before blackouts and energy supply instability is eliminated in some SADC countries. However, SADC has embarked on an irreversible path of energy cooperation, infrastructure development and sector reforms. With a better implementation framework for the regional bloc's resolutions, the future can be brighter.

REFERENCES

- Afrique En Ligne (2009)** Westcor Pulls out of Inga III Power Project. *Afrique En Ligne*, 14 January. Available from: www.afriquejet.com/afrique-news [Accessed 10 January 2011].
- Ali, R. (2005)** *Energy Resources and Regional Economic Cooperation in SCAARC Countries*. Available from: www.ifa.org.np/document/saarcpapers/ramzan.pdf [Accessed 20 November 2010].
- Bernanke, B.S. (2006)** Energy and the Economy. Speech before the Economic Club of Chicago, Chicago, Illinois June 15.
- CAREC (2008)** *Strategy for Regional Cooperation in the Energy Sector of CAREC Countries*. Endorsed by the Seventh Ministerial Conference on Central Asia Regional Economic Cooperation 19–21 November 2008 Baku, Azerbaijan.
- Glasure, Y.U. (2002)** Energy and National Income in Korea: Further evidence on the role of omitted variables. *Energy Economics* 24:355–365.
- Krugman, P. (1990)**: *Rethinking International Trade*, Cambridge: MIT Press.
- Motlhatlhedhi, F.O. (2009)** *SADC Energy Sector*, Presentation to Finnish/SADC Regional Energy Workshop, Gaborone Sun, Gaborone, Botswana, 19 January.
- New York State Energy Research and Development Authority (2008)** Available from: www.nyserda.org/sep/sepsection2-2.pdf. [Accessed 15 December, 2010]
- Oh, W. and Lee, K. (2004)** Energy Consumption and Economic Growth in Korea: Testing the Causality Relation, *Journal of Policy Modelling* 26, pp. 973–981
- Padoa-Schioppa, T. (2004)** Regional Economic Integration in a Global Framework, *The G-20 Workshop on Regional Economic Integration in a Global Framework*, Beijing, 22–23 September.
- Polachek, S.W. (1992)** *Conflict and Trade: An Economics Approach to Political Interactions*. In Isard, W. and C.H. Anderton, eds., *Economics of Arms Reduction and the Peace Process*.
- RERA (2010)** About RERA. Available from: <http://www.rerasadc.com> [Accessed 5 December 2010].
- SADC (2006)** *SADC Energy Programmes and Projects*. SADC, Gaborone, Botswana.
- SADC Today (2008)** Review of Progress on SADC Energy Recovery Strategy. *SADC Today*, Volume 11 No.3, December.
- SADC (2010)** Available from: <http://www.sadc.int/index/browse/page/52> [Accessed 25 July 2010].
- SAPP (2010)** *Annual Reports*. Available from: <http://www.sapp.co.za> [Accessed 11 November, 2011]

Sichone (2009) *Supporting the Electricity Supply Industry*, Presentation for the SAGCH Regional Forum on Success – Enhancing Competitiveness in Southern Africa: A Roadmap for Success Johannesburg, South Africa, 09-10 February.

Stern and Cleveland (2004) Energy and Economic Growth. *Rensselaer Working Papers in Economics 0410*, Rensselaer Polytechnic Institute, Dept of Economics.

Stern (1997) Limits to Substitution and Irreversibility in production and consumption: A Neoclassical Interpretation of Ecological Economics, *Ecological Economics*, 21:197-215.

Tian, J. (2009) Improving Regional Cooperation in Energy Today. *Regional Energy*. ADB.

Toman, M. and Jemelkova, B. (2002) Energy and Economic Development: An Assessment of the State of Knowledge, Paper presented at the Rural Energy Transitions conference, jointly convened by PESD and The Energy and Resources Institute in New Delhi, India, 5-7 November.

UNCTAD (2009) Economic Development in Africa: Strengthening Regional Economic Integration for Africa's Development, *Trade and Development Board*, 56th Session, 14-25 September.

UNECA (2009) *Towards Monetary and Financial Integration in Africa*. Addis Ababa, Ethiopia.

World Bank (2010) Available from: <http://data.worldbank.org/data-catalogue> [Accessed 27 September 2010]. ¶

