

# AFRICA INFRASTRUCTURE INVESTMENT REPORT



2013



Published in association with:



And:



An initiative of





# THE AFRICA INFRASTRUCTURE INVESTMENT REPORT 2013



Published on behalf of the Commonwealth Business Council by:

**Commonwealth Business Communications Limited**

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Designer: Tina Davidian  
Production Manager: Daniel H Brown  
Printer: Buxton Press Ltd

Copyright: Commonwealth Business Communications or as otherwise stated.

First published: March 2013

ISBN: 978-0-9570432-6-8

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# WELCOME

MESSAGE FROM PETER LONGWORTH  
DIRECTOR GENERAL  
COMMONWEALTH BUSINESS COUNCIL



I am delighted to introduce the Africa Infrastructure Investment Report produced by the Commonwealth Business Council (CBC) in collaboration with the Programme for Infrastructure Development in Africa (PIDA) – the new continent-wide initiative led by the African Union, NEPAD Agency and the African Development Bank.



We are delighted to facilitate dialogue through this timely publication and its launch event, the Africa Infrastructure Investment Networking Forum.



A core function of the CBC is to provide a bridge between the private sector and governments, between emerging markets and developed markets and between small businesses and international private sector. With public private partnerships being crucial for the implementation of Africa's infrastructure projects, we are delighted to facilitate dialogue through this timely publication and its launch event, the Africa Infrastructure Investment Networking Forum.

Developing regional infrastructure is crucial to sustaining Africa's current economic growth and

competitiveness. This Report outlines the infrastructure deficit and challenges, highlights models for financing the continent's ambitious projects and provides a sector-by-sector guide to the main priority areas, namely energy, transport, water and ICTs.

Partnerships are key to bridging the infrastructure gap; as such this report spans across multilateral organisations, regional economic communities, member states, donors and delivery organisations; all committed to implementing Africa's infrastructure plans. Our hope is that this Report provides an effective platform for organisations

to meet, share knowledge and collaborate in delivering the solutions that are shaping and building the new Africa.

Finally, I wish to thank our strategic partners – the International Project Finance Association (IPFA), the trade association for the project finance industry, and the range of hugely eminent authors, sponsors and advertisers that have contributed to this Report. Together we can realise the vision of developing Africa's regional and continental infrastructure and promote socio-economic development and poverty reduction across the continent.

# WE USED TO SCHEDULE REPAIRS.

Faced with ever-shrinking budgets and constant streamlining, governments, utility agencies and businesses around the world are struggling to keep their operations running smoothly. That's why leaders and their teams are fixing the way they fix things.

## FROM SCHEDULED TO PREDICTIVE MAINTENANCE.

The world has always worked on scheduled maintenance. "Change your oil every 3,000 miles," for example. The problem is, things don't always break on schedule. With predictive maintenance, organizations are able to anticipate not only when a problem will occur, but where and how. Which means that instead of fixing things whether or not they need it, they can predict a problem and help prevent it from becoming an even bigger one.

## FIXING WHAT WILL BREAK NEXT, FIRST

Imagine a leaky faucet in your house. Now imagine you have 10,000 leaky faucets and



they're all buried under-ground. That's what senior managers at a major city's water utility were constantly struggling with. Rather than replace every pipe and valve in the system, they

added sensor and analytics that can identify which assets are most in need of attention. Now the utility can pinpoint small leaks and stem them before they become floods.

LET'S BUILD A SMARTER PLANET.



*Predictive maintenance can help reduce breakdowns by up to 75%*

Managing its infrastructure proactively rather than reactively has helped the utility reduce its customer calls by 36%.

## REPLACING INTUITION WITH ANALYTICS.

With IBM predictive maintenance, you can spend less time and fewer resources repairing things. Because the simplest and most efficient way to fix a problem is to make sure the problem never happens in the first place. To learn more, please visit us at [ibm.com/predictivemaintenance](http://ibm.com/predictivemaintenance)

# NOW WE PREDICT THEM.

# FOREWORD

MESSAGE FROM DR IBRAHIM ASSANE MAYAKI  
CHIEF EXECUTIVE OFFICER, NEPAD



On behalf of the New Partnership for Africa's Development (NEPAD) Agency, it gives me great pleasure to share with you the Africa Infrastructure Investment Report. A comprehensive guide for planning, funding and developing infrastructure, this Commonwealth Business Council Report comes at a time when infrastructure is taking centre stage on Africa's development agenda.

Since its launch in 2001, NEPAD has recorded numerous policy frameworks and programmes such as the NEPAD Short Term Action Plan (STAP), the Comprehensive Africa Agriculture Development Program (CAADP) and more recently, the Programme for Infrastructure Development in Africa (PIDA). PIDA is a joint initiative of the NEPAD Planning and Coordinating Agency (NPCA), the African Union Commission and the African Development Bank in collaboration with several other African stakeholders, including the Regional Economic Communities (RECs) and Member States (MS).

PIDA provides a common framework for us to build the infrastructure necessary for more integrated transport, energy, ICT and trans-boundary water networks to boost trade, stimulate growth and create jobs. Implementing it will transform the way we do business, help deliver a well-connected Africa and realise the building of the African Economic Community, as outlined in the 1991 Abuja Treaty.

Among its objectives, PIDA aims to develop a supply-side web of 37,200km of highways, 30,200km of railways and 16,500km of interconnected power lines by 2040. It also plans to add 54,150 megawatt of hydroelectric power generation capacity and an extra 1.3 billion tons throughput capacity at the ports.

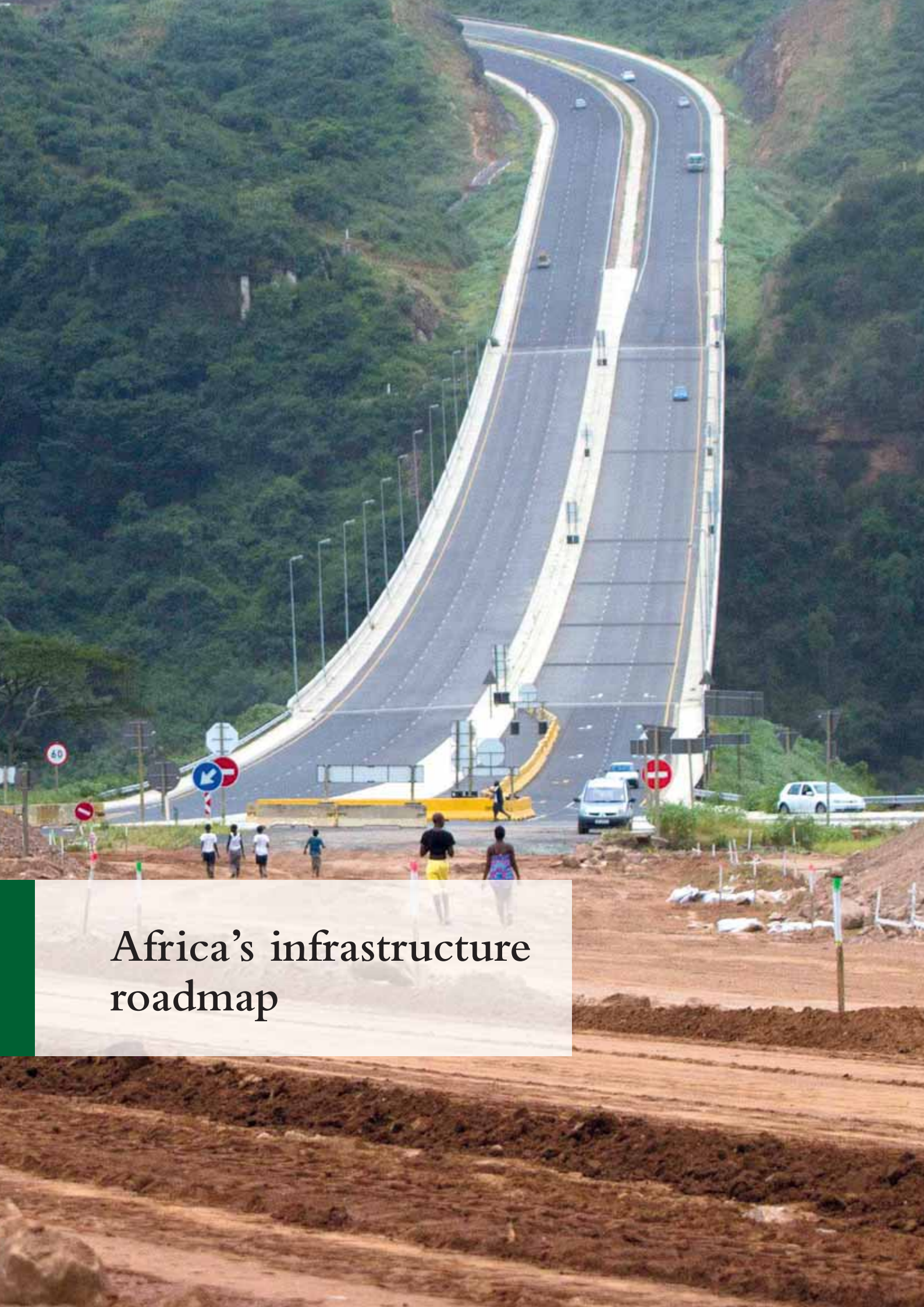
With capital costs for PIDA estimated at more than US\$360 billion by 2040, and US\$68 billion by 2020, at present, the funding gap stands at US\$31 billion per year which includes 75 per cent of capital investment and 25 per cent of maintenance expenditures.

In order to close this funding gap and efficiently implement PIDA, prudent coordination structures and mobilising of all relevant funding sources, both public and private are required.

The Institutional Architecture for Infrastructure Development in Africa (IAIDA) architecture defines the implementation mechanism of PIDA where Member States are to drive the delivery of projects, with Regional Economic Communities playing an implementation process oversight role.

As the agency tasked with PIDA implementation coordination, I call upon the development partners and the private sector to support the African Union's 'one-programme, one voice' regional and continental infrastructure agenda in support of PIDA's delivery, which support, we sincerely hope, will help realise the Africa Union's vision and inclusive growth agenda, for an integrated, prosperous and peaceful continent, driven by its citizens and standing as a dynamic force on the world scene.





## Africa's infrastructure roadmap

# ADDRESSING AFRICA'S INFRASTRUCTURE CHALLENGES



**Jacob G Zuma**, President of the **Republic of South Africa** and Chairman of the Committee of Heads of State of the **Programme for Infrastructure Development in Africa** (PIDA) outlines initiatives to address Africa's infrastructure challenges and issues an invitation to participate in African integration.

## THE IMPACT OF AFRICA'S INFRASTRUCTURE DEFICIT

Africa is faced with a huge challenge of infrastructure deficit, which limits regional integration initiatives. Integration influences the rate of development on the continent, and is therefore essential as a building block towards a prosperous Africa.

Improving continental infrastructure is the foundation upon which Africa's development rests. Without sound and well-maintained infrastructure, national economic development will remain severely constrained. Infrastructure has been responsible for more than half of Africa's recent improved performance, and has the potential to contribute even more in the

future. Conversely, inadequate infrastructure holds back faster growth in Africa.

Efficient infrastructure networks have the effect of generating new investments in other sectors. In view of the fact that the majority of Africa's population lives in rural areas, an integrated and efficient infrastructure system will unleash the production potential of these communities and provide the necessary links to markets.

Expanding road networks and electrical generation capacity provides a basis for industrial manufacturing, and the ability of the agriculture sector to fulfil its potential contribution to economic growth. The growth of the rural

economy in primary production, value-adding agro-industries and non-farm enterprises, is critically linked to rural roads that are well maintained and to accessing power. These are the vital developmental areas that African leaders view in the most serious light.

The lack of infrastructure in Africa is widely recognised, and the impact of this deficit on competitiveness in Africa is clear. African countries (particularly those south of the Sahara) are among the least competitive in the world, and infrastructure appears to be one of the most important factors in the determination of their global competitiveness. The global competitiveness indices (GCIs),





calculated by the World Economic Forum, are revealing. Generally, for Africa, these indices are lower than those of other regions of the developing world and infrastructure appears to be the underlying factor that contributes most significantly to this relatively low competitiveness.

### PICI PROJECTS

In addition to other initiatives, and to create a catalyst for infrastructure development in Africa, the NEPAD Heads of State and Government Orientation Committee (HSGOC) in Kampala in July 2010 adopted

the Presidential Infrastructure Championing Initiative (PICI). At the 16th AU Summit in January 2011, the African Union (AU) adopted the PICI projects. I am honoured to be the chair of a committee of eight NEPAD Heads of State whose primary responsibility is to ensure forward movement of critical projects. As African leaders, we have realised the enormity of the impact of the infrastructure deficit on the continent.

In essence, PICI is defined as an Africa-driven infrastructure programme for the continent with the aim of providing links



These projects should ultimately unlock the economic potential of the continent and provide development opportunities for communities, cities and regions. 

for people and goods to move between markets and places, and to contribute to the overall economic development of the continent. This initiative has linked Heads of State to specific infrastructure corridors, to ensure political leadership in the championing of cross-border infrastructure projects. Ideally, these projects should ultimately unlock the economic potential of the continent and provide development opportunities for communities, cities and regions. The PICI process is a prerequisite for the successful completion and delivery of these projects.

### THE BIRTH OF PIDA

In addition to the PICI initiative, we met as African leaders and identified the need for the following:

- A strategic framework for the development of regional and continental infrastructure in the areas of energy, transport, information and communication technologies (ICTs) and trans-boundary water resources
- An infrastructure investment programme (short, medium and long-term) around priorities established by the regional economic communities (RECs), and
- An implementation strategy and processes including, in particular, a priority action plan.



These elements have been addressed in the PIDA, which was adopted during the January 2012 AU Summit. The overall goal of PIDA is to promote socio-economic development and poverty reduction in Africa through improved access to integrated regional and continental infrastructure networks and services. The PIDA covers transport (air, sea, river and lake, lagoon, rail and road), energy (electricity, gas, petroleum products and renewable energy), ICTs, and trans-boundary water resources (primarily irrigation, hydropower, and lake and rivers transport), and deals with the regional and continental aspects of these sectors.

“The overall goal of PIDA is to promote socio-economic development and poverty reduction in Africa.”

The PIDA has brought together and merged various continental infrastructure initiatives, such as the NEPAD Short Term Action Plan, the NEPAD Medium to Long Term Strategic Framework (MLTSF), and the AU Infrastructure Master Plans into one coherent programme for the entire continent. It covers all the four key sectors of transport, energy, trans-boundary water and ICT. It is anticipated that PIDA will provide the much-needed framework for engagement with Africa's development partners willing to support regional and continental infrastructure.

The initiative focuses on sponsoring catalytic regional infrastructure projects through political leadership and championing. Significantly, this provides a much-needed platform to mobilise domestic and foreign resources for development impact. The project aims to promote regional economic integration by bridging the infrastructure gap. This will greatly improve trade through reliable and adequate infrastructure, which in turn will contribute towards economic development on the continent.

### AN INVITATION

There are seven Presidential Infrastructure Projects currently in progress championed by seven African countries, with South Africa having the honour to champion the North-South Corridor road and rail project, also headed by myself. The countries championing each of these projects are responsible for providing visibility, unblocking the bottlenecks, coordinating resource mobilisation and ensuring the implementation of the projects.

These programmes provide an opportunity for African countries to work together towards the development of the continent. As well as attracting investment, they fulfil the role of propelling Africa's development forward by encouraging job creation in selected sectors that will make the most impact. They are a stepping stone for the African continent to boost competitiveness in economies by accelerating growth, increasing efficiency and the effectiveness of governments. This will in turn improve the living standards of Africa's people.

I invite the private sector, as well as all of Africa's various development partners, to be

part of this programme. Your support will help realise the African vision and strategic plan for a prosperous, peaceful, and sustainable African economy, driven by its people and standing together as a dynamic force on the world scene.

### Jacob Gedleyihlekisa Zuma

is President of the Republic of South Africa, and Chairman of the Committee of Heads of State of the Programme for Infrastructure Development in Africa (PIDA). He joined the ANC in 1958, and was active in the struggle against apartheid, before serving 10 years' imprisonment on Robben Island. After a period of exile and following the unbanning of the ANC in February 1990, he was one of the first ANC leaders to return to South Africa to begin the process of negotiations with the then apartheid regime. In December 1994, he was elected ANC National Chairperson. He served as Deputy President of South Africa from 1999 until June 2005. During his tenure he distinguished himself in his role as mediator and facilitator of peace on the continent, especially in Burundi and the Democratic Republic of Congo (DRC). Zuma was elected ANC President in December 2007, and was elected President of the Republic of South Africa in May 2009.

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# PIDA – AN OVERVIEW OF THE PROGRAMME TO TRANSFORM AFRICA



**Shem Simuyemba**, Chief Infrastructure Economist at the **African Development Bank**, details the main areas and initiatives covered by the Programme for Infrastructure Development in Africa (PIDA), and points out new investment opportunities to supply Africa's priority needs.

Africa is a vast continent with about 20 per cent of the world's land mass and 16 per cent of its population. With an unparalleled natural resource endowment, Africa is still far from realising its full growth potential. Africa's stated goal, as enshrined in the Abuja Treaty of 1991, is the creation of an African Economic Community (AEC) as a means to re-position Africa as an integrated, inter-connected and prosperous continent. The Regional Economic Communities (RECs) have been identified as the building blocks for achieving this objective, and infrastructure as the key catalyst to transforming Africa.

Numerous studies, analysis and forums, conducted by the African Development Bank (AfDB)

and others, have brought out the fact that one of the biggest constraints to Africa's growth and competitiveness has been fragmented, inadequate and underperforming infrastructure systems in terms of transport, ICT, energy and water. The key to unlocking Africa's growth potential is investment in its infrastructure.

The African Union Commission (AUC), in partnership with African Development Bank (AfDB), the NEPAD Planning and Coordinating Agency (NPCA), the United Nations Economic Commission for Africa (UNECA) and the RECs, with input from African countries, recently completed formulating the Programme for Infrastructure Development in Africa (PIDA).

“Continuing growth and prosperity will swell the demand for infrastructure, already one of the continent's greatest impediments to sustainable development.”

This continental initiative, based on regional infrastructure projects and programmes, will help address the infrastructure deficit that severely hampers Africa's competitiveness within itself and in the world market.

Figure 1. PIDA projects by sector and region

Sector	Number of projects	Cost US\$ billions		Region	Number of Projects	Cost US\$ billions
Transport	24	25.400		Continental	7	3
Energy	15	40.300		North Africa	2	1.3
TWR	9	1.700		West Africa	16	6.2
				Central Africa	9	21.5
ICT	3	0.5		South Africa	6	12.6
				East Africa	11	23.3
<b>Total</b>	<b>51</b>	<b>67.9</b>			<b>51</b>	<b>67.9</b>

But infrastructure is a regional and continental problem that requires a regional and continental solution.

PIDA provides a strategic framework for African stakeholders and partners to build the infrastructure necessary for more integrated transport, energy, ICT and trans-boundary water networks to boost trade, spark growth and create jobs. Implementing it will transform the way Africa does business, and will help deliver a well-connected and prosperous Africa. The approval of PIDA by the African Heads of State and Government at their 18th Summit in Addis Ababa in January 2012, signalled a high-level political buy-in into this ambitious but achievable initiative.

## ECONOMIC GROWTH AND REGIONAL INTEGRATION

PIDA assumes that the average economic growth rate for African countries will be 6 per cent a year between 2010 and 2040, driven by

a surging population, increasing levels of education and technology absorption. This growth implies that, over the 30 years to 2040, the GDP of African countries will multiply six-fold, and the average per capita income will rise above US\$10,000 for all countries. This continuing growth and prosperity will swell the demand for infrastructure, already one of the continent's greatest impediments to sustainable development. Assuming that this growth is achieved, Africa's infrastructure needs are starkly apparent:

- Power demand will increase from 590 terawatt hours (TWh) in 2010, to more than 3,100 TWh in 2040, corresponding to an average annual growth rate of nearly 6 per cent. To keep pace, installed power generation capacity must rise from present levels of 125 GW (comparable to the United Kingdom) to almost 700 GW in 2040.
- Transport volumes will increase six to eight times, with a particularly strong increase of up to 14 times for some landlocked countries. Port throughput will rise from 265 million tonnes in 2009, to more than 2 billion tonnes in 2040.

- Water needs will put some river basins – including the Nile, Niger, Orange and Volta under immense ecological pressure unless measures for sustainable water management are put in place.
- Information and communications technology (ICT) demand will swell by a factor of 20 before 2020, as Africa catches up with broadband. Demand, around 300 gigabits per second in 2009, will reach 6,000 gigabits per second by 2018.

Investment across food value chains will be critical and so will be the requisite infrastructure.

This growing infrastructure demand presents a critical challenge for Africa as the continent seeks to compete in global and regional trade markets that rely on just-in-time production and flexible, speedy

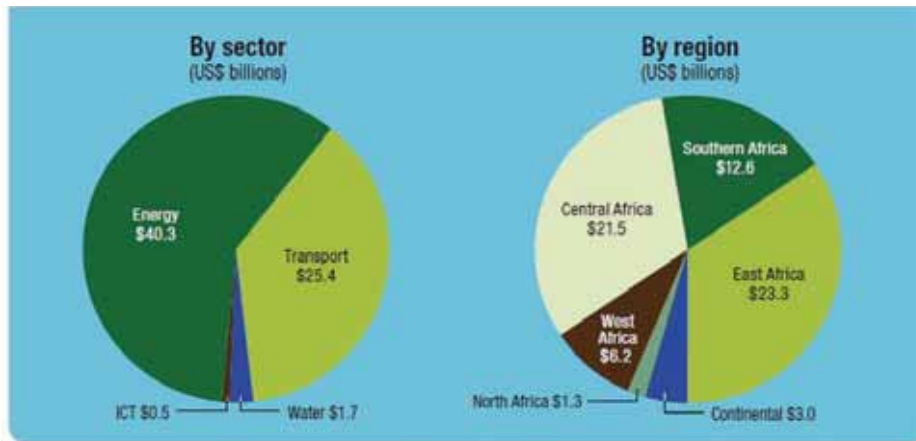


Figure 2. Total capital cost of PIDA's PAP by sector and region: US\$67.9 billion through 2020



Figure 3. PIDA transport networks 2020 and 2040

and reliable delivery. Closing the infrastructure deficit is vital for economic prosperity and sustainable development. But infrastructure is a regional and continental problem that requires a regional and continental solution, hence PIDA. Because Africa's economic geography is particularly challenging, and because its infrastructure needs are so great, regional integration is the best, and perhaps the only, way for Africa to realise its growth potential and equitably share the benefits of an increasingly connected world marketplace.

This is why the realisation of PIDA is hinged on the RECs and countries in the respective regions. The key RECs in this regard are the Economic Community of West Africa States (ECOWAS) in west Africa, the Economic Community of Central African States (ECCAS) in central Africa, the east African Community (EAC) in East Africa, the Southern African Development Community (SADC) in southern Africa, the Inter-governmental Authority on Development (IGAD) in the horn of Africa, the

Arab Maghreb Union (UMA) in north Africa and the Common Market for Eastern and Southern Africa (COMESA) which straddles eastern and southern Africa.

PIDA will allow countries to meet forecast demand for infrastructure services and boost their competitiveness by:

- Increasing efficiencies
- Accelerating growth
- Facilitating integration into the world economy
- Unleashing intra-African trade
- Creating jobs
- Expanding opportunities for big and small businesses, and
- Improving living standards.

The essential benefits of a regionally integrated approach to infrastructure development are to make possible the formation of large competitive markets in place of small, isolated and inefficient ones – and to lower costs across production sectors. Apart from markets for goods and services, the realisation of PIDA will also give rise to regionally integrated markets for infrastructure services such as power trade, ICT services and transport services. The

growing trend in trade in services across Africa, particularly financial services as financial markets deepen, requires state-of-the-art communications infrastructure.

### THE TRANSFORMATIONAL NATURE OF PIDA

PIDA is transformational in terms of scale and scope. PIDA will enable countries to:

**Reduce energy costs and increase access.** Africa will reap savings on electricity production costs of US\$30 billion a year, or \$850 billion through 2040. Power access will rise from 39 per cent in 2009 to nearly 70 per cent in 2040, providing access for an additional 800 million people.

**Slash transport costs and boost intra-African trade.** Transport efficiency gains will be at least US\$172 billion in the African Regional Transport Integration Network (ARTIN), with the potential for much larger savings as trade corridors open. Steady advances in regional integration and services will finally create a shift from overseas trade to trade between countries and within



Figure 4. Energy generation and transmission programmes (PIDA PAP 2020 and PIDA 2040)



Figure 5. Trans-boundary water resources (PIDA PAP)



Figure 6. Internet connectivity and exchange points (IXPs)

and across regions, helping fulfil the promise of the 2028 African Common Market.

#### **Ensure water and food security.**

Africa has the lowest water storage capacity and irrigated agriculture in the world, and about half the continent faces some sort of water stress or water scarcity – and demand is going to surge. To deal with the coming crisis, PIDA will enable the water storage infrastructure needed for food production and trade.

#### **Increase global connectivity.**

PIDA will boost broadband connectivity by 20 per cent. Increasing broadband penetration by 10 per cent, which can be expected by 2018, will increase GDP by 1 per cent by strengthening connections between goods and markets and between people and jobs.

### **KEY DRIVERS OF AFRICA'S GROWTH**

#### **New resource discoveries.**

Africa's full resource potential is yet to be realised. In recent years Africa has increasingly become known as the world's new resource

frontier, with discoveries of oil and gas in countries such as Ghana, Mozambique, Tanzania, Kenya and Uganda – and the list keeps growing. These discoveries will require major infrastructure investments but they also offer the prospects for Africa to move to financing infrastructure from her own resources.

**Population growth.** Trade and competitiveness are not the only considerations when planning Africa's infrastructure future. In 2010 Africa had 51 cities with more than a million residents and two (Cairo and Lagos) with more than 10 million. By 2040 it is expected to have more than 100 cities of more than a million residents and at least seven topping 10 million. Implicit in this surging population forecast is the rising number of Africa's workforce, but also new infrastructure which will be required for these new sprawling urban centres in terms of real estate development, mass transport systems, communications, water and waste management, as well as social services in terms of education, health and recreation.

“Africa is increasingly getting integrated into the global economy and its share of world trade will not continue to be marginal.”

**Food production and food security.** As populations increase, so will the demand for food in its various forms to meet the needs of diverse populations and income groups. Investment across food value chains will be critical and so will be the requisite infrastructure in terms of transport, water and irrigation systems, energy and dams, warehousing and distribution systems. This includes specialised infrastructure such as cold storage chains for regions like east Africa, which are leading export regions in terms of horticulture and floriculture.





The private sector investor/project finance partner would generally be looking for political stability and 'buy-in' by all political stakeholders. ”

**Deepening regional integration arrangements.** As regional integration arrangements in Africa mature, with regions moving to free trade areas, customs unions and common markets, inter-regional trade is increasing and so is the scope for developing regionally oriented industrial value chains. According to the African Development Bank's just released *Development Effectiveness Review 2012*, intra-Africa trade has increased from US\$49 billion in 2005, to US\$108 billion in 2011. Trade in services is also growing as African markets become increasingly liberalised, and as financial markets across Africa deepen. Additionally, Africa is increasingly getting integrated into the global economy and its share of world trade will not continue to be marginal. These developments place new demands on Africa's infrastructure systems and will require increased sophistication and efficiencies in Africa's new generation infrastructure.

### THE ROLE OF THE PRIVATE SECTOR

An important aspect of unlocking Africa's infrastructure potential will be to leverage private sector financing. However, to do this requires that factors that make a

project attractive to private finance are addressed. The private sector investor/project finance partner would generally be looking for political stability and 'buy-in' by all political stakeholders; continuous high-level political support; a pipeline of attractive, viable projects; fair, reliable and transparent procurement with open competition; enforceable contracts; shared risks commensurate with return; well-defined and consistently applied 'rules of the game'; and projects that lead to stable and predictable returns and to new opportunities.

All these ingredients are generally in place in Africa. However, to be relevant they need to be brought to bear at the project level. This requires forging public-private partnerships (PPPs) not just in the delivery of Africa's infrastructure but also in terms of informed dialogue between the two sectors on the key issues impacting on Africa's infrastructure delivery. This results-driven dialogue could create immense opportunities for private sector participation in driving Africa's infrastructure. Thus, the private sector, both within and outside Africa, needs to position itself to play this catalytic role.

It is therefore important to recognise that the private sector role in Africa's infrastructure is critical not just as financiers, but also conduits for innovation and technology; skills development; and creating capacities in construction and maintenance as well as equipment manufacture to ensure that Africa's new infrastructure performs at optimal levels and to global standards.

### INFRASTRUCTURE INVESTMENT OPPORTUNITIES

PIDA offers opportunities for public and private sector

involvement in rolling out Africa's new modern infrastructure requirements. Total financing requirements for PIDA up to the year 2040 are US\$360 billion. Of this, the PIDA Priority Action Plan (PIDA PAP) which constitutes 51 priority investment programmes and projects in energy, transport, ICT and trans-boundary water is estimated at US\$67.9 billion up to the year 2020. In terms of sectoral distribution, the largest funding requirements for the PIDA PAP are for energy at US\$40.3 billion or 59.4 per cent of the total funding requirements, followed by transport at 37.4 per cent – representing a combined share of 96.8 per cent for energy and transport, with the rest going to water and ICT.



Results-driven dialogue could create immense opportunities for private sector participation in driving Africa's infrastructure. ”

In terms of geographical distribution, east Africa comes first, at US\$23.3 billion, followed by central Africa at US\$21.5 billion and Southern Africa at US\$12.6 billion, with west Africa at US\$6.2 billion and north Africa at US\$1.3 billion. This variation in demand by region is a reflection of the extent of regional connectivity and the stock of infrastructure in the respective regions, and consequently the corresponding



infrastructure gap that needs to be filled. A summary of the sectoral and regional distribution of investment needs is given in the previous figures.

“Variation in demand by region is a reflection of the extent of regional connectivity and the stock of infrastructure in the respective regions.”

#### OUTLOOK FOR INFRASTRUCTURE SECTORS

**PIDA transport networks in 2020 and 2040.** The transport programme links the major production and consumption centres, provides connectivity among the major cities, defines the best hub ports and railway routes and opens the landlocked countries to improved regional, continental and global trade. Investment opportunities in transport include:

- The Trans-Africa Highway (TAH) network
- The transport corridors
- The Africa hub port and railway projects.

#### PIDA energy generation and transmission programmes for 2020 and 2040.

The energy infrastructure programme focuses on major hydroelectric projects and interconnects the power pools by creating a vibrant Africa-wide power market. It is designed to meet the forecast increase in demand driven by the extractive industry sector, industrial and household consumption and trade.

Investment opportunities in energy include:

- Hydro power plants such as Inga
- Transmission lines and interconnectors
- Oil pipelines
- Gas pipelines.

#### PIDA programmes and projects on trans-boundary water resources.

The trans-boundary water programme targets the development of multi-purpose dams and builds the capacity of Africa's lake and river basin organisations so that they can better plan and manage hydraulic infrastructure. The water-food-energy nexus is particularly critical in this respect. Investment opportunities in water include:

- Multi-purpose dams such as Palambo, Fomi and Gourbassy
- Water transfer projects such as Lesotho Highlands Water Project
- Management systems/infrastructure for river and lake basins.

**PIDA's ICT programmes.** The ICT programme will establish an enabling environment for completing the land fibre-optic infrastructure and installing internet exchange points in target countries. It will connect each country to two different submarine cables to take advantage of the expanded capacity.

Investment opportunities in ICT include:

- National and regional integrated broadband infrastructure across Africa
- Internet infrastructure (exchange points) across Africa.

Infrastructure is the key to unlocking Africa's growth potential. Africa has defined its priority needs through PIDA. The concluding question therefore is, "Africa is ready. Is the world ready for a new Africa?"

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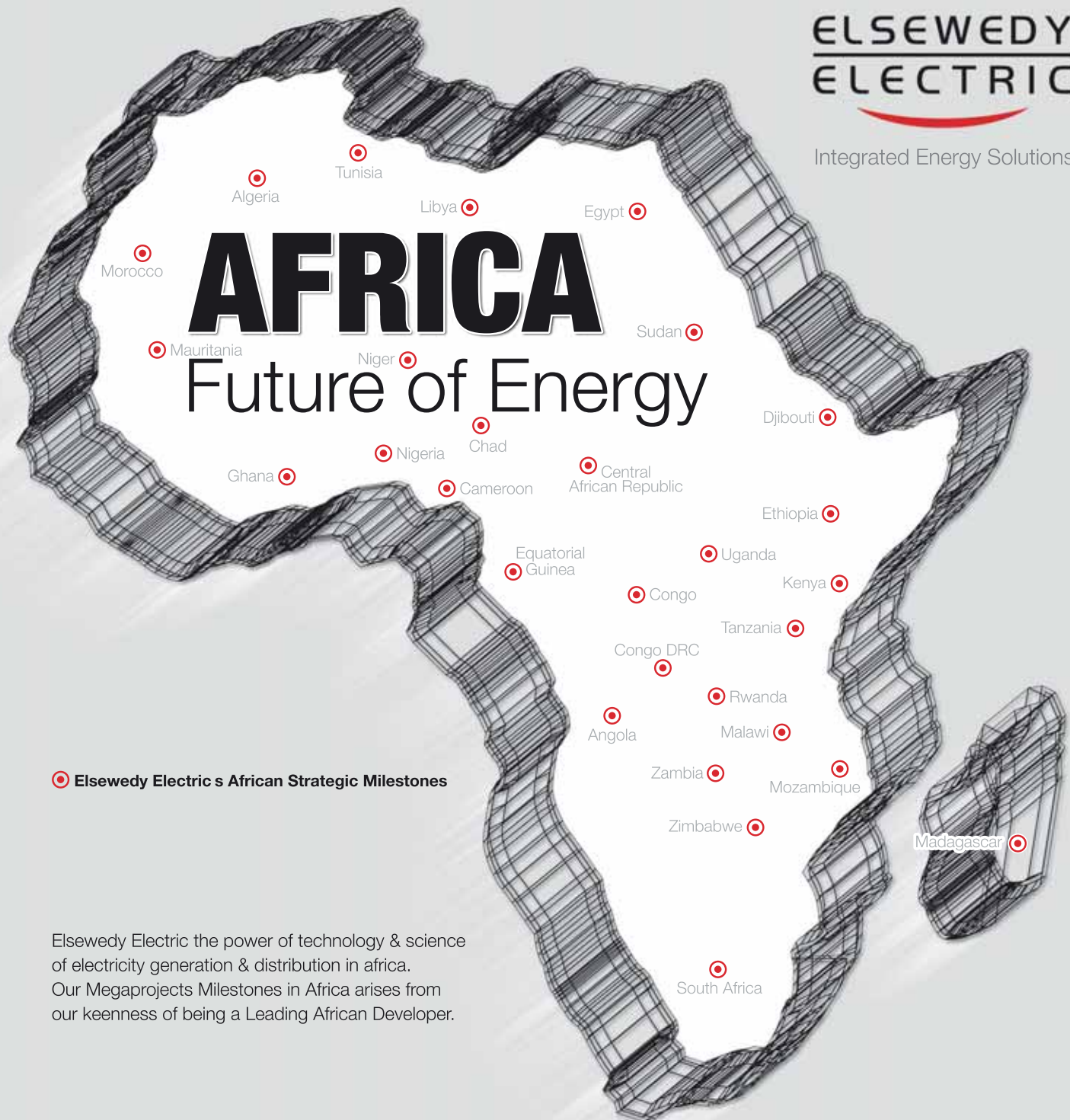
#### The African Development Bank Group (AfDB) is a

multilateral development finance institution established to contribute to the economic development and social progress of African countries. Founded in 1964, the AfDB's mission is to fight poverty and improve living conditions on the continent through promoting the investment of public and private capital in projects and programmes that are likely to contribute to the economic and social development of the region. The AfDB is a financial provider to African governments and private companies investing in the regional member countries.

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# ENGINEERING CAPACITY NEEDS IN SUB-SAHARAN AFRICA



**Holly Wright** and her co-authors at the **Africa-UK Engineering for Development Partnership**, report on the results from their review on the engineering capacity needs in sub-Saharan Africa.

Sufficient engineering capacity is essential to the economic and social development of any country. It is a basic requirement for the provision of infrastructure that enables better healthcare, access to education and the development of an attractive environment for foreign investment. It is a key driver for innovation and growth. In sub-Saharan Africa (SSA), infrastructure development lags significantly behind other developing regions. This is manifested by road networks that are fragmented at best, ubiquitous power shortages and very limited access to services for SSA's largely rural population. Despite the obvious need, there is a striking lack of data on engineering capacity in SSA.

This paper identifies shortages of engineering capacity in SSA, in

terms of the size and skills base of the work force, and makes recommendations for building capacity to address the issue. This is not a comprehensive study as it focuses largely on English speaking countries. However, as there is a serious lack of literature on the subject, this study aims to highlight the problems and make progress towards developing an understanding of the issues involved.

The research for this paper included; a literature review, an electronic survey of 113 professional engineers and 29 decision-makers from 18 countries and a set of interviews with 15 senior engineering stakeholders with experience in a variety of SSA countries. While the study intended to evaluate capacity needs across all engineering disciplines,

“Despite the obvious need, there is a striking lack of data on engineering capacity in SSA.”

the majority of interviewees and survey respondents worked in civil engineering, which is also the focus of much of the available literature.

## SCALE AND NATURE OF CAPACITY NEEDS

Sub-Saharan Africa suffers a chronic lack of indigenous capacity in engineering. Quantitatively, there are insufficient numbers of engineers





graduating to meet demand in some SSA countries. Evidence of engineer shortages was found in all of the countries for which data was available; South Africa, Rwanda, Mozambique, Malawi and Tanzania. Often it is the public sector that bears the brunt of this shortfall, as most unfilled posts appear to be in government positions in rural areas. However, there are also notable levels of unemployment among engineering graduates, indicating that the problem is more complex than a simple lack of numbers.

Unemployment among engineering graduates may be partly due to reluctance on their part to take poorly paid positions in rural areas, or down to the dominance of foreign engineering firms that import foreign labour. However, the predominant reason identified in this study was that engineers were graduating without the necessary skills and experience to be employable. To quote one interviewee from Zambia The universities are able to churn out the engineers in numbers... but many of them do not have the skills to be able to operate in a

global economy.

All three parts of this study indicate that low engineering capacity in SSA is more accurately described as an inadequate number of engineers with sufficient skills and experience, rather than as an insufficient number of engineers per se. The scale of the problem varies between engineering sectors, professional levels and countries, but it is a problem that is prevalent across the region. The complex variety of factors that combine to contribute to this problem range from global market forces to inadequate education.

#### CAUSES OF LOW CAPACITY

The evidence suggested that several root causes of low capacity in SSA relate to government policies and approaches to engineering. Low-level public investment in engineering projects over several decades has meant an inconsistent demand for engineers, which has seriously limited the opportunities for engineers to gain marketable skills and experience. Furthermore, governments in SSA often fail to safeguard engineering standards

through requirements for professional registration. Several of those interviewed for this study claimed that suitable regulations on registration did not exist in their countries, or that existing legislation was not properly enforced.

“That low engineering capacity in SSA is more accurately described as an inadequate number of engineers with sufficient skills and experience.”

The failure or lack of regulation in relation to foreign engineering firms is also damaging to local capacity. Local content laws, where they do exist, are often not appropriately enforced to ensure

Improved transport, power and communications networks are all crucial to the development of better services. 》》

knowledge transfer from foreign companies to local engineers. Poor quality education is also a key factor. Engineering courses in SSA are often too theoretical, based on outdated curricula and not relevant to local needs. Engineering faculties often do not have the resources to provide appropriate laboratory experience. Salaries for academic staff are generally low making it difficult to attract high quality staff and those who do teach at universities often engage in other activities to earn extra income, which diverts some of their time from teaching. In particular, universities struggle to compete with the private sector to attract academic staff with industrial experience.

The lack of opportunity to gain student work experience or to receive training once in the workplace are also important factors. Those engineers who do obtain marketable skills and experience often migrate to other countries where pay and working conditions are better, resulting in a 'brain drain' from SSA. Talented engineering graduates may be lost to other sectors such as banking, finance, IT and management consultancy.

Also contributing to low engineering capacity is the weakness of professional

engineering institutions in SSA, which are typically poorly resourced.

This one weakness alone creates:

- An inability to administer a formal process of engineer registration (the importance of which is outlined above)
- A vacuum of resources for educational institutions to improve their engineering courses
- A lack of support for the professional development of their members
- A limited capacity to provide expert advice to policy-makers.

It is evident that across the region the engineering sector suffers from a shortage of skilled and experienced engineers 》》

#### LOW CAPACITY HINDERS DEVELOPMENT

A consensus emerged from the literature, interviews and survey that the severe lack of engineering capacity in SSA seriously hinders development in the region.

Most conspicuously, low engineering capacity is an obstacle to the development of national and regional infrastructures, which has a direct impact on the ability of countries in SSA to develop. For example, improved transport, power and communications networks are all crucial to the development of better services.

Where engineering skills shortages are most acute, infrastructure gaps are even more difficult to reduce. The impacts of low capacity are most easily seen in rural areas where existing infrastructure is often extremely poor and where it is most difficult to attract skilled engineers to work. Poor infrastructure is also a deterrent to foreign investment.

Beyond the direct impacts of poor infrastructure, lack of engineering capacity hampers economic growth. The limited capacity of local providers, for example, has led to widespread reliance on foreign engineering companies, which can result in capital flight and a reduction in employment opportunities.

#### KEY CONCLUSIONS AND RECOMMENDATIONS

There is a severe lack of engineering capacity in SSA. While there is variation among countries, it is evident that across the region the engineering sector suffers from a shortage of skilled and experienced engineers. This can be a substantial obstacle to achieving development goals, from the provision of basic sanitation to the reduction of rural poverty. The causes of low capacity are numerous, ranging from poor engineering education to a 'brain drain' of talent to other sectors and countries.

There is a widespread need for greater recognition that the benefits of investing in physical infrastructure extend beyond the built assets and services delivered, to include the socio-economic benefits associated with building and maintaining those assets. Furthermore, countries that rely on foreign investment and expertise in the engineering sector must develop strategies, which use that investment

and the presence of foreign professionals, to build domestic capacity and reduce that reliance in the long term.

The recommendations below are not just demands for greater investment. They address the need for a better understanding of the crucial role that engineering capacity plays in enabling development in SSA, with a view to supporting a more effective deployment of resources.

“There is a widespread need for greater recognition that the benefits of investing in physical infrastructure extend beyond the built assets and services.”

#### International agencies need to:

1. Invest in research to map engineering capacity needs and existing capacity building support
2. Include integrated capacity building components in all infrastructure investments
3. Procure from domestic sources

#### Governments need to:

1. Invest in research to map national engineering capacity
2. Develop intelligent industrial policy (such as local content requirements, infrastructure investment and ‘buy domestic’ government procurement) to create jobs, promote enterprise development and improve skills training

3. Establish and enforce a statutory requirement for professional registration of engineers
4. Invest in improving engineering education
5. Develop policies to prevent further ‘brain drain’ and put engineering knowledge at the heart of policymaking

#### Industry needs to:

1. Build stronger links with higher education institutions to ensure that graduates are equipped with the skills and knowledge industry requires
2. Provide more frequent CPD opportunities for engineering staff.

#### Professional institutions need to:

1. Put pressure on governments to establish and enforce a requirement for professional registration of engineers
2. Establish and enforce a requirement for members to enhance their competence through CPD

#### Higher education institutions in SSA need to:

1. Establish a process to routinely review and update engineering curricula to meet the needs of employers
2. Build stronger links with industry and with education institutions in other countries.

As International Policy Advisor at the **Royal Academy of Engineering**, **Holly Wright** manages the Academy’s Africa-related activities, including its involvement in the Africa-UK Engineering for Development Partnership.

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**Petter Matthews** is senior international development specialist with over 20 years experience, Mr Matthews is Executive Director of the charity Engineers Against poverty.

**Dr Jill Wells** is policy and research adviser at Engineers Against Poverty and has more than 35 years experience in development work. Her expertise lies in economic, social and labour issues related to the development of the construction sector.

The **Africa-UK Engineering for Development Partnership** brings together the engineering community in Africa and the UK in a consortium led by the Africa Engineers Forum, Engineers Against Poverty, the Royal Academy of Engineering and Institution of Civil Engineers. The purpose of the Partnership is to strengthen the capacity of the African engineering profession and promote mutually beneficial links between engineers in Africa and the UK.

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# INFRASTRUCTURE IN THE WEST AFRICA REGION



**Kadré Désiré Ouedraogo**, President of the **Economic Community of West African States (ECOWAS)** Commission, explains the current priorities in infrastructure for the Community's west African member states, and details linking projects that will enhance coordination and business development.

Over the years, internal trade among The Economic Community of West African States (ECOWAS) member states has been around 11 per cent of total trade flows, with transport and logistics cost ranking among the highest in the world. However, in response to several sectoral initiatives, UNCTAD in 2012 indicated a steady growth in intra-community trade in the ECOWAS region, growing in value by over 60 per cent. ECOWAS states include the Commonwealth members The Gambia, Ghana, Nigeria and Sierra Leone.

With a population of about 300 million, the region registers an annual economic growth rate around 6 per cent. In view of the continued discovery of oil and consistent economic growth, the demand for infrastructure in

communications/ICT, transport, energy and water has been projected to reach significant levels by continental infrastructure research reports including the Programme for Infrastructure Development in Africa (PIDA).

In the area of transport, for instance, it was generally identified that the capacity of existing community road networks was enough to accommodate projected traffic over the next 10 – 20 years. Most sections, however, required rehabilitation and maintenance, with full construction needed on some 20 per cent of these road corridors.

Seaports along the region's coastline were also identified to be nearing capacity and required expansion to accommodate the projected increase in container traffic – especially

transit traffic from landlocked countries, which is expected to increase by 10–14 times over the next 30 years. Similar expectations have been projected for freight movement, calling for investment in railway rehabilitation to support intra-community trade.

In the area of energy, the region abounds in energy resources – oil, gas and hydro potential – even though unevenly distributed and minimally exploited. Energy access rates are very low and the market is highly fragmented. The increase in demand forecast for the West Africa Power Pool is 8.9 per cent, requiring an additional 90 GW due to the high growth rate of low income member states. Per capita energy consumption is expected to increase, with access growth of up to 67 per cent

expected in some jurisdictions. Investments are therefore needed in the area of generation, access and interconnection to aid the power pooling potential.

In the area of ICT, PIDA projected continental demand to grow by a factor of 20 before 2020, as Africa catches up with broadband. Demand, around 300 gigabits per second in 2009, will reach 6,000 gigabits per second by 2018. The ECOWAS Commission has therefore been pursuing several programmes to ensure maximum connectivity among member states.

## INFRASTRUCTURE DEVELOPMENT

In the light of the economic growth projections for the region, infrastructure development has been prioritised in the strategic planning of the Community to meet growth in traffic, population and trade. The five-year ECOWAS Strategic Plan therefore focuses on the need to:

- Improve rural access to energy and energy services
- Develop multimodal transport systems to improve connectivity between member states
- Reduce cost and enhance provision of infrastructure services
- Increase involvement of the private sector and public-private partnerships in infrastructure development
- Secure adequate funding for infrastructure projects, facilitating member states' access to funds and securing foreign capital and expertise.

Based on the Community's programming and the continental infrastructure development outlook, interventions being pursued to meet the infrastructure demand to support the integration agenda of the Community are highlighted in the following sections.

Figure 1. Trans-west African highway network



Figure 2. Existing west africa gas pipeline



## ROAD AND MARITIME TRANSPORT

**Trans-West African Coastal Highway (Dakar to Lagos) and Praia maritime link.** The remaining portions of the Trans-Coastal Highway road corridor that are in a run-down state and cannot be used by motor vehicles will be improved through rehabilitation or reconstruction. There is also the need to standardise all road sections of this corridor in terms of road dimensions, signage and markings, as well as safety and axle load limits. The coastal corridor from Lagos (Nigeria) to Dakar (Senegal) carries more than 75 per cent of trade in west Africa. It also links very vibrant seaports to the landlocked countries in the region, Burkina Faso, Mali and Niger.

Notably unacceptable sections of highway have been identified in the most fragile corridor member states, including Liberia, Sierra Leone, Guinea-Conakry (Republic of Guinea), Guinea-Bissau and The Gambia. Road sections such as the Moa Bridge (Sierra Leone) to Liberia border road (103 km); Bo through Monrovia and Greenville to Harper in Liberia; and Bissau-Boke-Quebo (Conakry), Bissau-Sao Domingos-

Mpak-Senegal border and the Bissau-Gabu-Conakry border have been earmarked for rehabilitation or reconstruction.

“The coastal corridor from Lagos (Nigeria) to Dakar (Senegal) carries more than 75 per cent of trade in West Africa.”

An important dimension of this corridor is the need to fully develop maritime services from the coastal land links to the offshore island member state of Cape Verde. The project involves the development of the Praia Hub into a maritime hub port with a new marine service based in the Port of Praia.

The success of these improvements would speed up regional integration, make African businesses more competitive and increase trade and tourism between the Cape Verde Islands and seven west African countries

(Senegal, The Gambia, Guinea, Guinea-Bissau, Sierra Leone, Liberia and Cote d'Ivoire).

**Trans-West African Sahelian Highway (Nouakchott–Dakar–N'Djamena) and Praia maritime link.** This 4,700 km corridor links the Sahelian sections of west Africa to central Africa. On the Trans-African Highway network, it is envisaged to provide a direct link from Senegal to Djibouti. The plan is to open up this corridor to promote trade between Niger and Nigeria as well as Niger and Burkina Faso. It will also improve the access of the Sahelian regions and member states along the Trans-Sahelian corridor.

Like the coastal corridor, two links identified for construction include the Koupela–Piega–Fada–Ngourma–Niger border and the Zinder–Nigeria border road. The objective is also to improve the level of service of the road and stimulate economic cooperation between Niger's second city of Zinder and northern Nigeria (Kano) in particular, and between neighbouring regions of the two countries in general. When completed, the Trans-Sahelian link will open up affected areas to agro-pastoral production and improved access to these areas in a national and regional network, improving the supply of cereals during food crises.

Interconnecting corridors such as Tema–Ouagadougou–Bamako, Abidjan–Ouagadougou–Bamako and Cotonou–Niamey–Ouagadougou will also have to be fully developed to support the transit traffic from the seaports to the landlocked countries.

## RAIL TRANSPORT

The Community has about 10,500 km of railways that are outdated, with three different gauges. This consists of 4,472 km

of 1,000m gauge, 4,593 km of 1,067m gauge and 1,409 km of 1,435m standard gauge. Signalling and telecommunications are rudimentary.

☞  
**The Trans-Sahelian link will open up affected areas to agro-pastoral production and improved access to these areas in a national and regional network.** ☞

The ECOWAS Commission undertook a feasibility study in 2008 based on the Regional Railway Master Plan adopted by the Heads of State and Governments in 1994. Based on a multi-criteria analysis, the study identified and prioritised 17 railway links for detailed studies and development, to support the Community's integration and trade.

The broader programme consists of the rehabilitation of 3,300 km of existing rail links at an estimated cost of US\$3.19 billion, and the construction of 6,700 km of new lines at a total estimate of \$25.87 billion throughout the region. The Commission is currently overseeing the detailed technical and engineering design study of the Abidjan–Ouagadougou–Niamey–Cotonou railway link with EU funding. Funds are being sought for detailed technical and engineering studies of the other sections which have been identified to have significant potential in freight and passenger traffic.

## INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

**The ECOWAS Wide Area Network (ECOWAN).** This is a public sector e-governance network that is expected to connect all ECOWAS institutions and member state governments and affiliated organisations. The project is expected to facilitate the exchange of information and provide a secure communication, administration and financial transactions portal within the community.

The project will put in place a fibre-optic network within member states ('middle mile' connectivity), enhance cross-border penetration as well as 'last mile' (end-user) connectivity. The coastal corridor leg of the network will connect cities along the coast and develop internal connections for Liberia, Sierra Leone, Guinea-Conakry, Guinea-Bissau and The Gambia.

## ICT terrestrial connectivity.

This project seeks to ensure that each member state has at least two broadband infrastructure connections, and also to provide access to submarine cables for all landlocked countries. The project will secure access to landing stations in ECOWAS. Implementation will include the feasibility studies and business plans on links including Mali–Niger–Nigeria and Burkina Faso–Benin; and broadband links between Mano–River Countries (Côte d'Ivoire, Liberia, Sierra Leone and Guinea) and neighbouring countries (Mali, Senegal and Guinea-Bissau).

## ENERGY

The West Africa Power Pool (WAPP). The WAPP is designed to integrate the national power systems of ECOWAS member states into a unified regional electricity market, with the



There remains a lot more to be done to strengthen economic infrastructure in the region. ”

objective of providing citizens with a stable and reliable electricity supply at an affordable cost. WAPP comprises generation and transmission capacities.

Extension of the West Africa Gas Pipeline. The existing West Africa Gas Pipeline which has been operating since 2009 has about 620 km of 20-inch pipe extending from Lagos (Nigeria) to Takoradi (Ghana) with a carrying capacity of 474 MBtu per day, with a potential to generate 2,500 to 3,000 MW of power. Detailed studies have been planned to assess the feasibility of extending the line through all member states along the coastal corridor to Senegal.

Energy access and rural electrification. Phase 1 of the Rural and Peri-urban Electrification Project across all ECOWAS member states is set to increase access to electricity to about 200 million people in the ECOWAS region by providing electricity supply to 5,000 villages. A study will be initiated to develop modalities for the identification and implementation of the entire programme.

## CONCLUSION

The attainment of global competitiveness is pertinently recognised as a key element in the mission statement of the ECOWAS Commission. Accordingly, the Commission seeks to create the requisite

conditions for competitiveness through the provision of basic economic and technological infrastructures; encouraging private sector participation in development; promoting the development and integration of capital and financial markets; and institutionalising an effective regulatory framework for the business environment.

In view of the well-proven relationship between infrastructure provision and poverty reduction, as well as wealth creation, the Commission identifies economic infrastructure which ought to be improved. This includes physical facilities such as roads, rail, ports, airports, water supply, sewerage systems, drainage and irrigation facilities, telecommunications, power generation and supply, and gas distribution. An initial assessment of about 20 selected priority projects in all the sub-sectors amounts to about US\$85 billion, comprising 85 regional infrastructure projects in transport, energy and ICT. There remains a lot more to be done to strengthen economic infrastructure in the region with a view to making the business environment appropriate for the global market.

### Kadré Désiré Ouedraogo

is President of the ECOWAS Commission. Formerly Prime Minister of Burkina Faso, his experience is grounded in the economic sciences and banking. He has served as Deputy Governor of the Central Bank of the West African States, and Ambassador Extraordinary of Burkina Faso to various European countries and the EU. While at Brussels he was Permanent Representative to the World Trade Organization and Chairman of the Africa, Caribbean and Pacific Group of States. Educated in

Paris (Pantheon–Sorbonne) he has also been a university lecturer in Analytical Accounting and Management Planning.

**The Economic Community of West African States (ECOWAS)**, a regional grouping with 15 member states in west Africa (three landlocked and one island), is one of the eight regional economic communities supporting the African Union in coordinating the implementation of continental and regional integration and development programmes in the west Africa region. The objective of ECOWAS is ‘to promote cooperation and integration, leading to the establishment of an economic union in West Africa in order to raise the living standards of its peoples, and to maintain and enhance economic stability, foster relations among member states and contribute to the progress and development of the African Continent’. This is envisaged to be achieved through a free trade area and customs union to create a common market. This objective was expanded in 1993, to include the creation of an Economic and Monetary Union of all West African countries. The current five-year Strategic Plan of the ECOWAS Commission from 2011–15, which aligns with the NEPAD Framework’s vision to eradicate poverty and engender sustainable growth and development, has infrastructure development and facilitation as a key focus.

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# Engineering Africa's Infrastructure

Stag Engineering Nigeria Limited is a leading wholly Nigerian owned engineering firm in Nigeria. The company has over 40 years' experience in providing expert engineering services and mercantile power to discerning clients in Nigeria and West Africa.

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# INFRASTRUCTURE CHALLENGES AND OPPORTUNITIES IN THE COMESA REGION



**Sindiso Ndema Ngwenya** (pictured) and **Abu Sufian E Dafalla** of COMESA explain the priorities for infrastructure development in eastern and southern Africa, and chart progress in project implementation and financing.

The Common Market for Eastern and Southern Africa (COMESA) is a regional grouping of nineteen member states. The main objectives of the COMESA Treaty are to promote a more balanced and harmonious development of members' products and market structure; create an enabling environment for foreign, cross-border and domestic investment; promote peace, security and stability; and promote joint development in all fields of economic activity among the member states. The COMESA region has a population of about 400 million people and GDP of US\$512 billion. COMESA has moved from preferential trading arrangements to a fully-fledged free trade area in which member states trade duty free and quota free for goods qualifying under the COMESA Rules of Origin.

Intra-COMESA trade has increased from US\$3.2 billion in 2000 to \$18.8 billion in 2011. COMESA total regional trade is more than \$200 billion (Figure 2.). However, the region has a low percentage of inter-regional trade, 8.8 per cent compared with ASEAN and the European Union (Figure 1. and Figure 3.).

The COMESA region is richly endowed with natural resources in the form of minerals, land and rivers. Hence there is a great opportunity to improve trade between members, so long as infrastructure is provided to stimulate trade and economic growth.

## INFRASTRUCTURE'S ROLE IN INTEGRATION

Regional integration is the process by which diverse national

economies seek mutual gains by complementing each other's strengths. Building regional integration of communities creates a series of general benefits to member states' economies, such as greater negotiating power, greater ability to attract investment and the extension of the market, among others. Infrastructure development improves and connects the economy: the cost of doing business goes down, competitiveness increases, new investments are stimulated, foreign customers are more satisfied and new markets open. Infrastructure forms an integral part of the productive system, facilitating the distribution of goods and impacting in a major way the earnings of companies within the economy, the organisation of territories and their economic and social progress.



Region	2007	2008	2009	2010	2011
COMESA	5.5	5.5	6.2	7.1	8.8
ASEAN	25.5	24.5	24.2	24.4	24.6
ECOWAS	–	–	8.0	6.9	–
EU	64.6	62.9	63.2	61.6	60.5
NAFTA	37.1	39.8	39.2	39.8	39.7

Figure 1. Interregional trade share by region (% of total trade)

Source: COMESA Statistic Unit

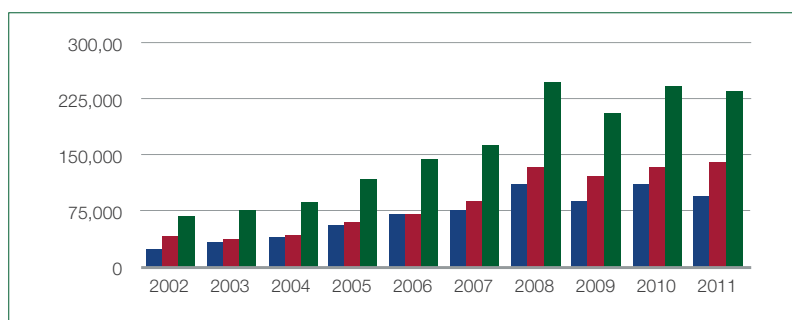


Figure 2. Global COMESA Trade, 2002 - 2011

Source: COMESA COMSTAT Database

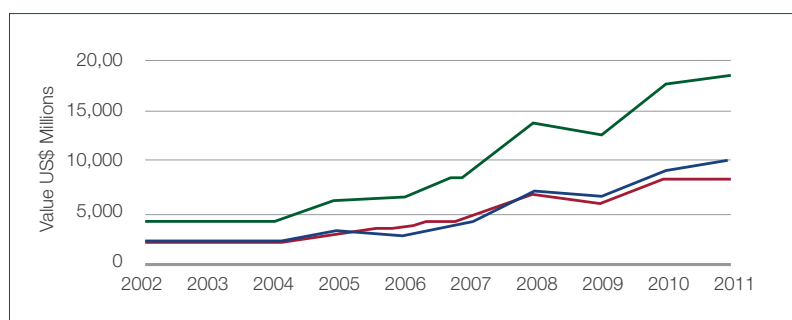


Figure 3. Intra-COMESA Trade Performance, 2002 - 2011

Source: COMESA COMSTAT Database

Infrastructure in the form of transport, telecommunications, energy and water is important in realising the goals of integration. Transport provides for the conveyance of goods and movement of people by road, railway or air; telecommunications enable people to initiate and execute business contracts and transfer data and other products. Energy is important in various stages of production coming from the processing, transport and distribution segments. The current infrastructure development requirements facing the countries of the region necessitate a comprehensive approach to improving regulatory and financing aspects, the manner in which infrastructure and services are conceived and planned,

improving integration and cooperation among the member states, and enhancing coordination with the private sector by means of public-private partnerships.

Cross-border interconnectivity can assist COMESA economic integration by enhancing resource sharing and efficiency, enlarging markets and increasing production, reducing costs of doing business, and establishing linkages with regional and global supply chains.

### INFRASTRUCTURE PRIORITIES

One of the six strategic objectives of the COMESA Medium Term Strategic Plan (MTSP) is to effectively address supply-side constraints related to the improvement of infrastructure

and other related issues in the region in order to reduce the cost of doing business and enhance competitiveness. The impetus for infrastructure development in transport and communications is to reduce the cost of doing business through policy and regulatory harmonisation, facilitation and development of regional physical transport and communications infrastructure. This is to be addressed in a holistic way through corridor and one stop border post (OSBP) approaches, the creation of an appropriate policy and regulatory framework, and the involvement of the private sector.

The infrastructure projects identified for prioritisation are contained in the COMESA Priority Investment Plan (PIP). These projects are ready

	Documents to export (number)	Time to export (days)	Cost to export (US\$ per container)	Documents to import (number)	Time to import (days)	Cost to import (US\$ per container)
East Asia and Pacific	6	21	923	7	22	958
Latin America	6	17	1,268	7	19	1,612
North Africa	6	19	1,083	8	22	1,275
OECD high income	4	10	1,028	5	10	1,080
SSA	8	31	1,990	9	37	2,567
Burundi	10	32	2,965	11	46	5,005
Egypt	8	12	625	9	13	755
Kenya	8	26	2,255	7	26	2,350
Mauritius	5	10	660	6	10	695
Sudan	7	32	2,050	7	46	2,900
Zambia	6	44	2,765	8	-	3,560
Zimbabwe	8	53	3,280	8	167	5,200

Figure 4. Cross-border trade comparisons. Source: World Bank Doing Business Indicators

for implementation. The projects cover the infrastructure sub-sectors of transport, information and communications technology and energy. The priority projects have undergone classic preparatory work including identification, feasibility, engineering design and cost estimates. This groundwork is supported by an environmental and social impact assessment and studies to determine the optimal method of implementation.

The task of project preparation is coordinated through tripartite agreements with COMESA, the East African Community (EAC) and the Southern African Development Community (SADC), and the Projects Preparation and Implementation Unit (PPIU), set up in 2011, which is hosted by COMESA. The functions of the PPIU include conducting the necessary upstream project preparation to establish a pipeline of projects in a database that will be accessible to potential investors.

The PPIU will make use of the resources already available through grants, and continuously work to mobilise more.

Trade integration within COMESA is not satisfactory, as shown in Figure 1, indicating that the potential for trade enhancement is significant. High trade and logistics costs (Figure 4.) have been major contributing factors to the low growth. The logistical concerns include the lack of quality road transport to ports, poor port infrastructure, cross-border delay and sub-optimal shipping networks. All these add to the overall transport costs. The OSBP approach implemented at the Chirundu border between Zambia and Zimbabwe has been shown to be successful in reducing the transit time significantly, as well as the cost of doing business. COMESA member states have agreed to replicate the Chirundu OSBP model at all border crossings to boost economic integration and increase interregional trade.

Infrastructure development is necessary to improve resource access, sharing and efficiency in the region, and to provide basic needs such as water and electricity. To address COMESA's energy needs, the COMESA Heads of States Summit (November 2012, in Kampala, Uganda) took decisions to speed the implementation of cross-border power interconnectivity and energy generation to achieve energy security, trade in energy services and resource sharing. The Summit further endorsed the decision to fast-track implementation of the transport and communications projects, as well as identifying the seed investor of the COMESA Infrastructure Fund and the recruitment of the fund's Director General.

### Challenges and opportunities

The COMESA regional infrastructure challenges are the result of varied levels of economic and infrastructure development in member states, including poor planning, low management

capacity, poor governance and a lack of regional and national integration and cooperation. This is the background behind the establishment of the regional enabling environment, corridors and OSBPs and the PPIU. Added to these challenges are high maintenance costs and massive financing requirements.

## FINANCING AND INVESTMENT

To cover the financing requirement, the COMESA Infrastructure Fund (CIF) has been founded. This will provide seed money and leverage funds from other sources, including the private sector. The first tranche of the CIF is US\$1 billion. There are 14 projects in the pipeline for financing by the fund.

The region has US\$112 billion excess reserves, part of which can be used to finance infrastructure projects. The COMESA Council of Ministers meeting in November 2012 took decisions to explore the possibility of floating regional infrastructure bonds and special purpose vehicles for the implementation of regional projects on the basis of Public-Private Partnerships.

Figure 5 below shows the current position of COMESA priority projects in the transport and telecommunications sectors.

The COMESA region offers many opportunities for trade promotion, investment attraction, production, market development and economic integration. Hence investment in infrastructure development will be most welcome to pave the way for future prosperity.

**Mr Sindiso Ndema Ngwenya** is the third Secretary-General of the Common Market for Eastern and Southern Africa (COMESA). Before his appointment in 2008,



A cross-border trader at Chirundu OSBP  
Source credit: Mark Tran/guardian.co.uk

Figure 5 (below). Advances in transport and telecoms projects, 2009 – 2011  
Source: COMESA

State of projects	Number of projects	Estimated investment (US\$ billion)
Concluded	5	0.6
Under implementation	17	3.5
Under preparation	208	34.1
Total	230	38.2

Mr. Ngwenya was Assistant Secretary General, in charge of programmes. In industry, Mr Ngwenya was involved in the design and implementation of programmes and projects in the road, airline and railway sectors. At the regional level, he was instrumental in the formulation of the PTA (now COMESA) regional integration programmes. He also worked on the establishment of COMESA specialised institutions. He has an MSc in Transportation and Traffic Planning.

**Dr Abu Sufian E Dafalla** is Acting Director Infrastructure Development of COMESA. Experienced in the design and development of enabling environments, trade facilitation and physical programmes for infrastructure development in the COMESA region, he has served and participated in many regional and international conferences. Dr Dafalla worked in COMESA as telecommunications officer for 12 years, and was appointed Acting Director of Infrastructure on 15th January 2012. He is the author of many internationally published papers.

## The Common Market for Eastern and Southern Africa

(COMESA) was formed in 1994 to replace the former Preferential Trade Area (PTA) which had existed from 1981. COMESA was established as “an organisation of free independent sovereign states which have agreed to co-operate in developing their natural and human resources for the good of all their people”. It has a wide-ranging series of objectives which necessarily include in its priorities the promotion of peace and security in the region. Its main focus is on the formation of a large economic and trading unit that is capable of overcoming some of the barriers that are faced by individual states. It has 19 member states and a population of over 389 million.

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# INFRASTRUCTURE PRIORITIES IN SOUTHERN AFRICA: THE SADC REGIONAL INFRASTRUCTURE DEVELOPMENT MASTER PLAN



**Remmy Makumbe** of the **Southern African Development Community (SADC)** Secretariat gives sector-by-sector details of the infrastructure priorities for southern Africa.

At the Lusaka Summit in 2007, the Southern African Development Community (SADC) conceived the Infrastructure Vision 2027, with the objective of establishing a strategic framework to guide the development of seamless and cost effective trans-boundary infrastructure. On the basis of the overwhelming priority accorded to infrastructure, policy-makers were instructed to develop the SADC Regional Infrastructure Development Master Plan (RIDMP). The RIDMP sets priorities on infrastructure development. The kernel is the Short Term Action Plan (STAP), developed to guide the implementation of the first phase, with support from the UK Department for International Development (DFID), through TradeMark Southern Africa

(TMSA) as the main funder of the Infrastructure Master Plan development process. The RIDMP is aligned to the Programme for Infrastructure Development in Africa, as well as the COMESA-EAC-SADC Inter-Regional Infrastructure Master Plan. The European Union, followed by the Development Bank of Southern Africa (DBSA), has provided significant resources to complement the process, within the framework of the SADC-International Cooperating Partner partnership.

Projects contained in the STAP are those that are considered ready for implementation during the next five years. During the short-term phase, other projects will be prepared to the level of bankability, ready for financing and implementation later. The

pipeline of projects will be continuously updated as additional undertakings undergo the preparation process. The STAP also includes 'soft' projects related to capacity building, regulatory and institutional strengthening. Special projects have been allocated for Mauritius and Seychelles, to ensure that their particular requirements are addressed.

The RIDMP is divided into sector plans, translated into a rolling programme anchored on the six pillars of energy, tourism, transport, ICTs, meteorology and transboundary water.

## ENERGY

The region has made significant strides in the establishment of regional infrastructure in the electricity sub-sector, as evidenced

by the interconnection of nine SADC member states to a regional power pool, the Southern African Power Pool (SAPP). Interconnections have optimised power system production and trade. What is clearly urgent now in the Regional Energy Sector Programme is to connect the remaining three mainland member states of Angola, Malawi and Tanzania to the regional power pool.

The RIDMP has revealed that, notwithstanding the current interconnectivity achievement, the SADC region is still facing a number of challenges with regard to energy delivery, access and price. In particular:

- The region has been facing an electricity deficit since 2007, and the identified gap should be filled by 2014; but indications are that projects may lag behind from lack of funding.
- Investment and financing are hampered by low tariffs, poor project preparation, no investors that can sign power purchase agreements (PPAs) under single buyer models, and lack of required policy and regulatory frameworks.
- Coal is the backbone of power generation in the region so far (contributing 75 per cent), yet is considered a polluting fuel by modern emissions standards.
- The hydrocarbon subsector is plagued by volatile prices; although the region is endowed with petroleum and gas resources, much is not available due to foreign commitments or inadequate infrastructure.
- Large estimated renewable energy (RE) potential needs infrastructure for grid connection, manufacturing and quality testing; and although the prices are coming down, RE needs innovative financing.

The Energy Master Plan is designed to address four key strategic objectives, namely ensuring energy security, improving access to modern energy services, tapping the abundant energy resources and achieving financial investment and environmental sustainability. Identified 'hard' infrastructure projects include the planned electricity generation and transmission projects; refineries, storage facilities and pipelines for oil and gas; and transport facilities for coal distribution and exports. To increase generation from the current 56,000 megawatts and surpass the projected demand of 96 megawatts by 2027, seventy-three power generation projects have been identified. Three major projects would facilitate the interconnection of Angola, Malawi and Tanzania to the SAPP.

The estimated investment costs of all planned electricity generation projects is US\$62 billion for the short term (2012-17), US\$39 billion for the medium term (2017-22) and US\$72 billion for the long term (2022-27), totalling US\$173 billion. The total cost of the prioritised projects would range from US\$42 billion to US\$122 billion. In addition, the estimated cost for priority interconnector and transmission projects is US\$3 billion.

### TOURISM

There is an urgent need to improve tourism infrastructure in readiness for the forecast growth that could see the SADC region receiving about 58 per cent of the total continental traffic by 2027.

Recent reports indicate that international tourist arrivals increased from 882 million in 2009 to 940 million in 2010, and reached 980 million in 2011. The World Tourism Organization forecasts a

growth of 3 per cent for the sector in 2012, and expects international tourist arrivals to reach the one billion mark. One of the SADC strategies to retain this market is the development of trans-frontier conservation areas to ensure ease of movement of tourists across the region, protecting the wilderness, creating employment and generating income in rural areas. The RIDMP Tourism Chapter identified an Infrastructure Development Action Plan comprising five priority projects among others, for implementation within the regional Transfrontier Conservation Areas. The estimated cost of these projects is US\$1.1 billion.

“The pipeline of projects will be continuously updated as additional undertakings undergo the preparation process.”

### TRANSPORT

The transport sector includes road and rail, ports, maritime and inland waterways, as well as air transport. In respect of surface transport, the highlights of the analysis indicate that there is a widening gap in the provision of infrastructure in the surface transport subsector across the region. While roads have improved in most countries, rail lines have seen very little development. With a focus on multimodal transport linkages and improving interconnectivity, the region adopted a corridor strategy in 2008 which has yielded the flagship North-South Corridor project.



The SADC corridor approach to regional development is based on well maintained and operated infrastructure and the provision of seamless transport services. Realisation of trade projections will require the transport and logistics sector to increase capacity and performance, to serve both intra-regional and overseas trade. It is expected that transit traffic for landlocked SADC countries will increase from 13 million tonnes in 2009, to 50 million tonnes by 2030, and 148 million by 2040, at an average annual growth rate of 8.2 per cent.

“While roads have improved in most countries, rail lines have seen very little development.”

It is critical that transit facilitation is addressed for the six landlocked SADC countries – Botswana, Lesotho, Malawi, Swaziland, Zambia and Zimbabwe – in order for them to enjoy realistically competitive prices for landed products as well as exports to global markets.

The SADC regional railways, which are extensive, contiguous and use a common gauge (Cape), should be operating seamless, relatively fast cross-border services. However, they are operated as a collection of national systems. Common technical, operating and safety standards need to be established and enforced so that railways can run across borders under the oversight of a regional regulator. A multilateral regional

business agreement needs to be negotiated between railways. The SADC railways generally operate well below their original design capacity. The Sector Plan suggests projects to revitalise the existing lines and construct missing links (especially those serving the mining sector). Rehabilitation projects are the Sena line to Beira and Malawi, the Lobito line in Angola and the SNCC system in the Democratic Republic of Congo (DRC)

Regarding the ports, more private sector participation should be encouraged for terminal operations, as is the case at Dar es Salaam and Beira. Enhancing maritime safety and security is a major port goal which impacts on the cost of maritime transport. Most regional ports are currently operating near or over capacity. Some of the factors causing delays and high costs are poor port/road and port/rail interfaces, poor handling capabilities and equipment, congested access routes, inefficient layouts, insufficient use of operating software, insufficient berths and drafts and slow clearances by regulatory agencies and transport operators.

Regarding air transport, private or quasi-private operation of airports, airport services and air navigation services might be explored in the context of establishing a regional body. Issues of market access in compliance with the continental market liberalisation initiatives within the framework of the Yamoussoukro Decision are being addressed in the tripartite (COMESA-EAC-EADC) context through the establishment of a Joint Competition Authority and competition regulations. Identified priorities for cooperation include airport modernisation, expansion and rehabilitation, integration of the regional upper air space, implementation of the Yamoussoukro Decision,

“Most regional ports are currently operating near or over capacity.”

incorporation of ICAO Standards and Recommended Practices into national legislation and establishing joint regional training institutions. The SADC region has numerous airports, many of which are currently being upgraded. The RIDMP identifies key transport projects for roads, railways, inland waterways, land borders, air and sea ports, at a cost of US\$100 billion over the plan period.

## INFORMATION AND COMMUNICATION TECHNOLOGIES

Information and communication technologies (ICTs) have become the life-blood of the knowledge economy. The goal of the ICT Sector Plan is to ensure that every citizen has full access to this vital resource. The region has stepped up momentum in the development of regional infrastructure in the field of ICTs. High access costs prevail across the region, severely limiting use, especially for broadband services among the general public, and this in turn constrains demand for the development of local applications and services, with the resultant continued use of inefficient manual processes.

The current status of ICTs in SADC can be summarised as follows:

- Average mobile uptake is 60 per cent of the population, ranging between 20 per cent and 100 per cent.
- 6 per cent of total voice subscribers are fixed line holders, underlining the importance of mobile networks.



Road between Nyamata and Kigali  
© Flickr, Dave Proffer

- 4 per cent of SADC residents are internet users, with a wide variation from 1 per cent in DRC to 40 per cent in Seychelles.
- Fewer than 25 per cent of the borders between neighbouring SADC member states have internet traffic exchanged directly between each other.

“The region has stepped up momentum in the development of regional infrastructure in the field of ICTs.”

The ICT Chapter has identified projects aimed at improving the enabling policy and regulatory environment for encouraging increased private sector investment in ICT infrastructure, bridging of the gaps within the SADC Regional Information Infrastructure (SRII) Project, facilitating full integration of SADC member states, as well as focusing on rehabilitation of life-expired links within the regional fibre backbone network,

and extensive enhancing of postal systems. The total estimated cost of provision of ICT infrastructure and implementation of other identified projects is US\$383.4 million.

### METEOROLOGY

The SADC region lacks appropriate meteorology infrastructure. This poses a serious threat to planning processes in the context of the changing patterns of climate. Improved quality of life demands accurate and timely weather forecasts and seasonal climate predictions. An early warning system is required to avert disasters related to meteorological and hydrological extremes, which are increasing all across Africa. Climate-induced fatalities have been reduced, but economic losses are increasing.

The study identified a number of regional projects which focus on:

- Strengthening of the meteorological observation network infrastructure for monitoring and analysis of weather and climate variability and change
- Improvement, through modernisation, of meteorological telecommunications and communication systems for rapid data collection, management, processing, exchange and dissemination of

data and information

- Improvement of technical capacities in terms of resources and expertise
- Strengthening the institutional capacity of national meteorological services to provide relevant, reliable and timely tailored products for users of climate and weather services, and
- Strengthening the capacities of climate and meteorological institutions to function as efficient regional coordination, development services and dissemination centres.

The estimated cost of implementing the projects is US\$125 million.

### WATER

The most compelling indicators revealed by the Water Diagnostic Study are that the SADC region is only retaining 14 per cent of the available renewable water resources, 10 per cent being held in the Kariba and Cahora lakes on the River Zambezi, the largest man-made reservoirs in the region. The rest of the available renewable resource goes back to the sea. The indicators show that, of the estimated total of 2,300 cu km a year of renewable water resources, the current level of abstraction is only 44 cu km a year, or 170 cu metres per capita. Of this, 77 per

cent is used for irrigation, 18 per cent for domestic purposes and 5 per cent by industry.

The statistics indicate that there would be adequate water resources to support the citizens of SADC if appropriate infrastructure could be made available.

The Water Chapter identified some 34 water infrastructure projects and that are ready for immediate implementation between 2013 and 2021, with an estimated cost of US\$16 billion. The projects are designed to:

- Increase renewable water storage from 14 per cent to 25 per cent
- Increase area under irrigation from 3.4 million hectares to 10 million hectares (by 13 per cent of potential)
- Increase hydro power generation from 12 gigawatts to 75 gigawatts (an increase from 8 per cent to 50 per cent of potential)
- Increase access to water supply from 61 per cent to 75 per cent of the population, and Increase sanitation services access from 39 per cent to 75 per cent of the population.

### CRITICAL SUCCESS FACTORS

Certain critical conditions have to be met to ensure expeditious implementation of priority infrastructure projects, including:

- Commitment by member states and related agencies
- Creation and strengthening of oversight and implementing institutions
- An appropriate policy, institutional and regulatory framework
- Provision of a robust monitoring and evaluation system
- Availability of a pipeline of bankable projects

- Financial sustainability of project funding
- Partnership with private sector in infrastructure development
- Adoption of the 'user pays' principle.

“Fiscal discipline and abundant natural resources have combined to attract foreign direct investment into the region.”

The current economic growth in the SADC region of 4 to 7 per cent is propelled by rising external demand, high international metal prices, rising global incomes, resurgent capital flows and the sound macroeconomic policies of SADC member states. New investments are being made in mining and mineral outputs are increasing. Fiscal discipline and abundant natural resources have combined to attract foreign direct investment into the region. Continued growth will to a large extent depend on diversification, greater beneficiation and value addition of commodities which will in turn create local employment.

There is a critical requirement for improved intra-regional distribution networks, strengthened institutional capacity to attract sustained capital and increased domestic savings and investment. Efficient, integrated, cost effective infrastructure is a prerequisite for harnessing opportunities in the global economy.

**Remmy Makumbe** joined the SADC Secretariat as Director responsible for Infrastructure and Services in January 2005. He also officiated as Chief Director for three years from 2006. After attaining the rank of Chief Signal and Telecommunications Engineer in the National Railways of Zimbabwe, as well as Area Manager (Southern Area), he joined Southern Africa Transport and Communications (Technical Unit) as a railway technical expert for the SADC region. He later joined the Southern African Railways Association as Executive Director, a position he held until December 2004. He has written and contributed to numerous publications in the area of infrastructure.

### The Southern African Development Community

(SADC) is an inter-governmental body of 15 nations: Angola, Botswana, DRC, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, South Africa, Zambia and Zimbabwe. It focuses on cooperation among member states, in areas of development that include food security, infrastructure, peace and security, trade and industrial development, and gender and development. More specifically, the development of infrastructure as a tool for poverty reduction, deepening regional integration and reducing the cost of doing business are central to the SADC agenda. The Executive Secretariat is based in Gaborone, Botswana.

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# KOHATH INVESTMENT GROUP (KIG)



Kohath Investment Group was established in 2004 as a wholly-owned Nigerian company. From its early beginnings, providing consulting services to the oil and gas industry, KIG has evolved into a fully diversified company with five strategic business units set up with a mandate to become dominant players in their respective sectors.

## OUR MISSION

To serve local and global markets, by investing in new frontiers and emerging markets, while ensuring maximisation of shareholder value, good corporate social responsibility and the adoption of international best practices.

## OUR VISION

To become the most diversified conglomerate in Africa through strategic investments. We will contribute our quota to the development of Africa through innovative and ethical approaches to our business, driven by customer satisfaction.

## OUR CORPORATE STRATEGY

Our corporate strategy at Kohath Investment Group has evolved out of the understanding that our business activities cut across a diverse group of stakeholders including investors, employees, our host communities, suppliers and clients. Our corporate strategy policy is hinged on six key principles:

- Maximising shareholder value
- Human resource management
- Portfolio risk balancing
- Accountability
- Global best practice adoption
- Ethics

## OUR STRATEGIC BUSINESS UNITS

### Kohath Property Development Company (KPDC)

is focused on becoming a leading real estate development and investment company in Africa. KPDC and its international development partners provide our clients with turnkey real estate development services ranging from project conceptualisation, master planning, engineering and infrastructure design, construction and real estate marketing.

Today, our flagship new city development project, the Land of Honey City project in Abuja, spans a total land area of 1,767 hectares and upon completion will create a new decentralised focus area in the Federal Capital Territory. It is a mixed-use new city, 'the first of its kind' and will be the best planned Nigerian city, focused on the live-work-play concept – providing a comprehensive mix of land uses to cater for the needs of its residents and visitors.

### Kohath Mining Company

(KMC) was setup in 2010 to exploit Nigeria's vast and largely

untapped solid mineral resources, using state of the art technologies and international best practices in the mining industry. The company is currently developing its Tantalite, Iron Ore and Coal mining concessions in Nigeria. KMC's flagship project is the Oro Tantalite Mining and beneficiation project.

### Kohath Rice Company (KRC)

is aimed at developing local capacity in domestic rice production and reducing Nigeria's huge rice import deficit. KRC is currently developing an integrated rice production project, which is expected to commence production in 2014.

**Kohath Energy (KE)** is the most recent business unit of KIG, formed in January 2012 to explore and take advantage of opportunities in Nigeria's oil and gas industry, predicated on the following:

- Sustained growth in global energy requirements over the next four decades
- Untapped opportunities in Nigeria's oil and gas value chain
- Fulfilment of KIG's vision to be one of the most diversified conglomerates in Africa.



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# INFRASTRUCTURE & NIGERIA'S TRANSFORMATION AGENDA



Rich in resources and with the biggest population in Africa, Nigeria is a potential global superpower. The country is focused on becoming one of the world's strongest economies in just seven years time. There are challenges ahead, but **His Excellency President Goodluck Jonathan** is optimistic about what they can achieve.

When I took office as President of Nigeria in May 2011, I was given the chance to strive towards my vision of what Nigeria could be. I desperately want my country to be on a path towards economic freedom and the equitable benefits for all that realising our potential can bestow.

I refuse to let Nigeria be described in terms of unfulfilled promise and missed opportunities. Many factors have contributed to our nation being held back in the past; we have had to contend with various adversarial issues – from wanton violence and dictatorship to widespread corruption and poorly developed infrastructure – but we are steadfastly overcoming such challenges. We are finding solutions and building a sustainable future. Nigeria has the potential to be a

global superpower. Rich in natural resources and with 170 million people, 70 per cent of whom are under the age of 35, we are the most populous country in Africa and we have the biggest prospects. If we can combine intelligent planning, incisive strategies and effective implementation, we can grow to become one of the world's top 20 economies by 2020.

## TRANSFORMATION AGENDA

In order to succeed in our mission we have devised and are adhering to a transformation agenda. We are enacting sweeping reforms and working hard to improve our country's infrastructure. My government is adopting a holistic policy approach that encompasses all our industrial sectors and encourages harmony between

them to achieve the central goal of sustainable economic growth with direct benefits for all. Our national aspirations can be met using this long-term plan.

The key drivers in my government's transformation agenda are substantial investment and public-private partnerships (PPPs). This was why the ministries of commerce and industry were merged to form the ministry of trade and investment. Socio-economic progress does not come easily. It must be earned with a marriage of many elements, from intelligent strategy and policymaking through to effective implementation methods – putting theory into practice. We have devised plans before in Nigeria, and yet our socio economic progress did not leap forward as we hoped

A view over Abuja, Nigeria's capital. © Jeff Attaway



it might. Correspondingly, there has been an understandable lack of faith in politicians amongst the Nigerian people. Need-induced corruption in the past has bred cynicism and mistrust. However, my administration assures the Nigerian people and all potential investors that the development goals laid out in our Economic Transformation Blueprint – Nigeria Vision (NV) 20:2020 – can and will be realised.

### **NIGERIA VISION 20:2020**

The NV20:2020 is nothing short of a rallying call to all Nigerians, regardless of ethnicity, economic status, or religion – to unite and stand behind a common cause of placing the country firmly on a path of sustainable growth. Outlining our vision and development priorities, this strategic foundation encapsulates the imperatives for Nigeria's economic transformation and our ultimate aspirations. The NV20:2020 plan identifies the key sources of economic growth and describes how we can optimise them, whilst fostering sustainable social and economic development. It is central to help us build our future and make our vision a reality.

There have been previous plans put forth to tackle Nigeria's many challenges but they have all too often failed in their execution – we

have lacked the means to put words into action. We need mechanisms and a methodology for making strategies transpire into results. Any effective government in the world has a system whereby plans are executed and the inherent idea is manifested into quantifiable results – whether it is a system of monitoring government spending and rating its performance, or creating new ways to measure how public institutions are being used by the people.

Resources must be invested in to achieve this and, in turn, achieve evidence-based policy making, solid budget management and overall optimal performance as an effective government. By focusing on making our government, at both state and federal levels, more equipped at turning strategic intent into direct action and results, we can make the aims of the NV20:2020 a reality.

To accomplish this we must align all our management processes into a smoothly functioning machine. To translate strategy into results we set out our priorities and establish the right direction. We then focus on our targets and allocate a budget. Following this we conduct regular reports, evaluate performance and analyse results. Underpinning our renewed commitment to make NV20:2020 a reality are four clear imperatives:

Firstly, we have to ensure that the vision is clearly linked to existing mechanisms for execution, including medium term development plans, expenditure frameworks, medium term sector strategies and annual budgets.

Secondly, there must be monitoring and evaluation across all levels of government to improve their capability of translating all strategic plans and programmes into outcomes and impacts.

Thirdly, we will pass legislation to ensure adherence to the NV20:2020 plan and embed the specific reforms proposed in the plan.

Finally, we are defining a clear strategy for the mobilisation of our citizens to demand performance and accountability. We will also invest more in our data collection capability so that we can better manage performance. The recent technology upgrade at the National Bureau of Statistics is a positive development and we are continuing to work towards improved usage and capacity building. At present, the public reporting of performance is largely limited to statistical reports, but with the enactment of the Fiscal Responsibility Act, the reporting of budget performance will be enhanced at the federal level.

Agriculture and power are two performance sectors that it is crucial to monitor and improve wherever possible. These two industries are the twin engines at the heart of Nigeria and they must be kept running at optimal levels.

### **AGRICULTURAL INDUSTRY**

Nigeria is famed worldwide for the wealth of crude oil we are blessed with. Although we could not be more grateful for the opportunities open to us through our oil reserves, we should not let oil overshadow other areas of great

strength. Agriculture has long been, and will continue to be, a vital component for Nigeria and our future progress. The agricultural sector contributes 44 per cent of Nigeria's GDP and also employs the most people in our country. It plays an essential role in wealth creation and poverty reduction.

“We wish for foreign investors to join us not only for building their own business interests but also for the building of a better Nigeria.”

It is crucial that we diversify to ensure that we are not solely dependent on oil. We must expand our domestic food production and reduce our reliance upon food imports. Our Agricultural Agenda aims to increase domestic food supply by 20 million metric tonnes by 2015, and to create 3.5 million jobs in the sector over the next five years. However, if we are to achieve this, there needs to be parallel accomplishments in power sector reform and improvements in Nigeria's road network to make the Agricultural Agenda viable.

#### POWER: POLICY FRAMEWORK AND INFRASTRUCTURE

The reform of our power sector poses without doubt, one of our biggest challenges. It is a costly, complex and multifaceted reform that we are working to deliver – but we will get there and we invite trusted foreign investors to join us in reaping the benefits of our reforms. The power sector has been a poorly

performing industry for some time now and we have to drastically focus on infrastructure and eradicate the causes and symptoms of various malfunctions. With the assistance of PPPs and foreign investment, we are actively addressing issues of operational inefficiency and underpricing and we are already registering concrete financial gains.

#### THE PRESIDENTIAL TASK FORCE ON POWER

In order to maintain advancements and impart lasting reform in the power sector, I established the Presidential Task Force on Power (PTFP) in 2010. The PTFP unites all the agencies that can contribute to making private sector investment in the power industry a smoother experience. The PTFP helps to overcome any obstacles for investment and also evaluates the planning and execution of various short-term projects in generation, transmission and distribution that are essential to improve the capacity of Nigeria's power supply infrastructure.

Membership of the PTFP is made up of the Federal Ministry of Power, the Bureau of Public Enterprises (BPE), the Nigerian Electricity Regulatory Agency (NERC), the Nigerian National Petroleum Corporation (NNPC), the Bureau of Public Procurement, the Accountant General of the Federation and the Power Holding Company of Nigeria (PHCN). These groups all cooperate to ensure that my administration attains the necessary objectives for growing and maintaining the power sector.

#### THE PRESIDENTIAL ACTION COMMITTEE ON POWER

In 2010 I also formed The Presidential Action Committee on Power (PACP). The PACP acts like a War Cabinet for Nigeria's power sector and is comprised of ministers, government officials and heads of agencies that all play

a critical role in Nigeria's power sector. I am the Chair of the PACP and having recently reconstituted its membership, I make sure it is fulfilling its objectives – meeting regularly to check that issues connected to the power sector enjoy priority attention at the highest level.

The PACP and the PTFP are vital to my government for meeting the objectives of our roadmap to power sector reform. Together these bodies clear aside the hindrance of red tape and stamp out inefficient and over-bureaucratic decision making. Instead, we can devise high quality planning, monitor and evaluate risks and grant immediate approvals when necessary. Ministries and agencies also draw attention to issues that depend on other government entities to be successfully resolved – thereby uniting all factions of my government so that we can improve policy and technical capability. This is how we can achieve power delivery targets and build Nigeria's electric power sector on solid and sustainable foundations.

#### FOREIGN INVESTMENT AND THE ROLE OF THE ICRC

The opportunities for investment in Nigeria are broad and dynamic. We wish for foreign investors to join us not only to build their own business interests but also for the building of a better Nigeria. With good corporate practice and social responsibility given its due importance, our partnerships can not only provide attractive returns of investment, but also contribute to the advancement of our nation and our people.

Industries such as engineering, design, consultancy and project management, health, education, agriculture and ICT among others, are all open to investment. I am aware that we have some work to do in allaying the



fears surrounding investment in Nigeria and I hope to prove that the historical concerns such as a lack of security, failing contract sanctity and poor infrastructure – are all being dealt with by my government. We will show that there are no longer grounds for reluctance or a short-term attitude to investment. I have established the Infrastructure Concession Regulatory Commission (ICRC) to work towards the key objective of accelerating investment in national infrastructure. The ICRC achieves this by building a pipeline of public infrastructure investment projects using the ministries, departments and agencies that can attract private sector investment. I have also renewed the honour and integrity in contractual bonds.

### CONTRACT SANCTITY AND RULE OF LAW

My government acknowledges that historically in Nigeria, the sanctity of contract for foreign investors has been a point of great concern. Potential investors have been hesitant to commit to business projects, despite the positive return on investment promised, for fear of their investment being compromised or taken over by the state. I wish to quash any further anxiety with regards to the rule of law and the honour in contract sanctity.

The infrastructure of Nigeria is being greatly improved and the rule of law and the sanctity of contracts are being restored. We know that the principle of sanctity of contract is one of the most important legal concepts in the investment process and my government is committed to honouring the business partnerships that are helping to develop Nigeria and grow our economy. We are making every possible effort towards cultivating peace and stability in Nigeria and those companies who have placed their faith in us are reaping the benefits.

### YOUTH IS THE KEY

At the centre of our challenge to transform Nigeria into one of the leading nations in the world are our people, specifically our large youth population. They hold the key to the realisation of all our plans, policies and reforms. If we are to reach the heights of large-scale reform across the power and agricultural sectors, achieve successful infrastructure projects and instigate equitable economic growth, then we will need the skilled workers to make it happen. The youth of Nigeria's population can unlock the potential of their country and my administration aims to provide them with the opportunities to match their ambition.

The evolution of Nigeria to a nation enjoying peaceful economic freedom requires the participation of all



Nigerians. With a collective effort we can realise our true potential. We all play a part in making Nigeria a better place – young and old, businessman and farmer, entrepreneur, politician and investor. Of course, we must face challenges in order to benefit from a wide range of positive opportunities, but we can take on the tasks at hand and transform them into real improvements in our daily lives. United together we can triumph over adversity and help Nigeria to grow.

On May 29 2011, **Goodluck**

**Jonathan** was sworn in as Nigeria's third civilian president since the restoration of civilian governance in 1999. A graduate of the University of Port-Harcourt with a PHD in Zoology, Jonathan worked as an educational inspector and an environmental protection officer before beginning his career in politics in 1998. He is married to Dame Patience Jonathan and they have two children.



The Infrastructure Concession Regulatory Commission (ICRC)  
[www.icrc.gov.ng](http://www.icrc.gov.ng)

Presidential Task Force on Power  
[www.nigeriapowerreform.org](http://www.nigeriapowerreform.org)





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# CAPITALISING ON MOZAMBIQUE'S NATURAL RESOURCES



The President of Mozambique, **Armando Emílio Guebuza**, outlines the country's infrastructure challenges and highlights the crucial importance of improving infrastructure to capitalise on the country's newfound natural resources.

With the widely reported discoveries of significant gas reserves Mozambique has an added route out of poverty. We can believe in a dynamic future ahead with the chance to improve our lives, to break the shackles of being a poor nation and enhance the opportunities for creating the wellbeing of our people.

To do this successfully we must learn, and we must learn fast. The extractive industries, in their current form and quantities, are new to our country and our most pressing task is to absorb the knowledge and the technical and scientific expertise so that our newly discovered natural wealth does not become a missed opportunity. To realise our potential we must educate and apply ourselves with diligence.

## JOURNEY SO FAR

We have walked a long road and Mozambique has passed through some difficult and turbulent periods. We endured 500 years of colonial rule, fought for 13 years to gain independence and then suffered a brutal civil war that was imposed upon us. In recent years, several natural disasters also put Mozambicans through challenging times. But we are strong and our country moves forward. In the last 15 years, Mozambique's economy has grown steadily at over 7 per cent per year, driven by the service sector, light industries and agriculture. We are constantly making progress with our social and economic planning and last year our GDP stood at a healthy 7.5 per cent.

With more than US\$25 billion worth of projects planned or

underway, we are expecting even stronger growth to an average of 10 per cent each year between 2013 and 2016. This robust development has positioned Mozambique, the pearl of the Indian Ocean, as one of the world's fastest-growing economies.

## VITAL NEED FOR INFRASTRUCTURE

Our government is aware of the blessing we have received and the inherent responsibility of fulfilling our potential. The discoveries of coal and gas and the respective megaprojects being implemented will contribute greatly to the future prosperity of Mozambique and our people. But in order to effectively capitalise on this fruitful period in Mozambique's history, we must drastically bolster our infrastructure.

“The valuable gains to be enjoyed from building infrastructure are indisputable, but the costs can be prohibitive.”

To retain all present investment in the country and attract much more, we must have the capacity to transport the valuable minerals, coal and gas to market. We need improved roads, railways and ports, reliable electricity and telecommunications. With the betterment of our infrastructure and the fostering of a stable business environment, we can attain higher and faster rates of progress.

The importance of infrastructure to our country cannot be understated. Not only will it allow for greater national interconnectivity and with our neighbours but economic integration with the world at large. It is vital in accomplishing quantifiable gains in our quality of life and economic development. We must continue working hard to reduce the disparity between the productivity of our extraction industries and the essential infrastructure requirements for the domestic and global distribution of our resources.

Improved infrastructure in Mozambique will facilitate agglomeration economies, raise productivity and reduce the cost of private production and access to markets. We know that the return on investment for the enhancement of infrastructure can result in direct increases in GDP per capita by up to 10 per cent. Furthermore, improved infrastructure will have

a direct effect on Mozambicans, giving our people a chance to benefit more and more from our economic growth. There will be better access to health and education services, infrastructure-related employment opportunities and the ability to benefit from modernised transportation, energy and telecommunications.

#### SOURCE OF INVESTMENT

The valuable gains to be enjoyed from building infrastructure are indisputable, but the costs can be prohibitive. Due to a lack of immediate returns, the potential risks, and the long-term nature of infrastructure investment, the funds for such major undertakings are simply not available to a developing country like Mozambique.

However, I am pleased to say that our government continues to cooperate with the private sector, the World Bank, the African Development Bank and state credit agencies to finance the upgrading of our infrastructure, allied with the implementation of regulatory reforms and effective poverty-alleviation programmes.

#### OVERVIEW OF THE STATE OF INFRASTRUCTURE IN MOZAMBIQUE

To discuss the infrastructure of Mozambique, one must first appreciate the scale of our country. Mozambique is oblong and made up of 2,700km of coastline and approximately 800,000km<sup>2</sup> of land.

#### Roads

We have a road network which functions well from east to west, providing regional connectivity and linking mining and key production centres to our ports. However, we must tackle connectivity between urban and economic clusters and solve the problem of parallel corridors that would be more efficient if interlinked.

#### Rail

There are more than 3,000km of rail network connecting the three ports of Beira, Nacala and our capital Maputo to the landlocked neighbours. With our increasing levels of export, the capacity to adequately meet demand with supply is stretched but we believe, can be improved. We must also face the challenge of rail maintenance and expansion on a grand scale.

#### Ports

Mozambique has seven seaports and their performance has improved through public-private partnerships, but we must further invest to ensure the Beira port works at its fullest capacity and that Nacala is developed to be able to handle our increased mineral production.

“Mozambique can be considered a regional superpower in electricity, based on plentiful sources of power, energy-regulation reforms and major expansion.”

#### Air transport

We have eight major airports and our air transport facilities recently benefitted from two new terminals in Maputo and Nacala. We sought non-traditional financiers to achieve this, with investment coming from China and Brazil respectively. We must now work at aligning our safety regulations with international practices and improving the status of our national carrier LAM.

## Water

When it comes to water, Mozambique is relatively rich in resources, especially given our climate zone. However, we remain vulnerable to flooding and the subsequent hardship and displacement this inflicts upon our people. Our renewable water resource per capita is well above that of the sub-Saharan African average, but we share our hydrological resources with other countries and therefore have to contest with high hydrological variability. We need to improve our infrastructure to include sufficient water storage capacity that will combat cyclical droughts and floods. We also expect a marked increase in water consumption levels and even more so in water demand required for large industry use. We need water for hydropower, irrigation and for the protection of the environment – as such, it is vital that we create a suitable institutional and policy framework to adequately manage our conflicting water demands. We have made progress through well-implemented reforms in the urban water and sanitation sector, but we must always strive to accomplish more.

## Energy

Mozambique can be considered a regional superpower in electricity, based on plentiful sources of power, energy-regulation reforms and major expansion. Electricity is our fourth-largest revenue producer and we supply not only domestically but also to several neighbouring countries, including South Africa, Zimbabwe, and other Southern African Development Community countries. However, with the anticipated sharp increases in the annual growth of electricity demand we must ensure we can deliver. Our on-going challenge in the power sector is

to dramatically improve access to the power grid for both rural and urban populations, and ensure supply is sufficient and reliable for industrial use.

“As we venture forth into new territory with our involvement in extractive industries, we will promote complete transparency.”

## ICT

Information and communication technology is another area where Mozambique has performed comparatively well. The percentage of our population covered by a global system for mobile communications signal has risen from just 14 per cent in 2000 to over 90 per cent, in 2013. We have enacted institutional reforms that include the inception of a sector policy, the establishment of a regulatory body – the National Communications Institute of Mozambique – the creation of a universal service fund and the liberalisation of the telecommunications market. Despite the development of the mobile and Internet markets, we are aware that this sector will remain a constant challenge and we will continue to do our utmost with the resources available to improve the Internet-access market.

## ENSURING TRANSPARENCY

In tackling all these challenges for the enhancement of Mozambique's infrastructure, we are focusing on the importance of transparency. As

we venture forth into new territory with our involvement in extractive industries, we will promote complete transparency.

There has been consistent dialogue with the private sector via annual conferences and we have established trusted institutions that uphold our commitment to transparency.

The Attorney General's office, the Administrative Tribunal and the Parliamentary Accounts Committee all deal with public accounts and they form a frontline against corruption. We have adhered to a clear strategy for the licensing and concessions of oil exploration areas, with fiscal and tax registration applicable to contracts. Anti-corruption clauses are an integral part of all extractive industry contracts and mining licenses are open to public scrutiny and must, by law, be endorsed by the Administrative Tribunal. We have also joined the Extractive Industry Transparency Initiative, as it complements our own work in ensuring transparent, sustainable and judicious use of Mozambique's natural resources.

As a government, we firmly believe that a foundation of transparent economic governance must hold true in Mozambique. The promotion and demonstration of good governance and transparency will discourage corruption and lead to a more efficient and sustainable use of our resources.

## LEARNING FOR A POSITIVE FUTURE

We continue to learn in this new and competitive energy arena. We take great pride in our membership of the Commonwealth Family of Nations and continue to honour the shared values of democracy, freedom, peace, the rule of law and opportunity for all. We will learn through the expertise available





within the Commonwealth and we have also dispatched our experts on study tours to gather knowledge and advice from other countries. The road ahead will be long and the tasks at hand are daunting, but the destination is set. Above all, our national agenda is to make poverty history and we are currently focused on reducing poverty from an estimated 54.7 per cent in 2009 to 40 per cent by 2015.

We will continue to expand our public-private partnerships and we trust that our present and future partners from the private sector will also honour our mission. As well as generating profit and sustaining their own businesses, they should also seek to make a substantial contribution to Mozambique's development and join us as good corporate citizens in ending poverty.

With the support of bilateral and multilateral partners, we will continue to advance our infrastructure and work for sustainable development while maintaining our economic growth. Although we are grateful for our natural resources, we do not intend to rely on them alone for socio-economic development. Among other things, due attention will also continue to be given to human capital, agriculture, tourism and the diversification of the economy. But our resources will be an engine for sustainable social transformation and the industrialisation of Mozambique, with Mozambicans participating at every level of the workforce, from the production line to the boardroom.

With the government's leadership, the dedication of the people and a committed private sector,

Mozambique can achieve the status of a middle-income country within the next decade. We welcome international partners to join us on a mutually beneficial journey towards a brighter future.

A successful businessman and President of Mozambique since 2005, **His Excellency Armando Emílio Guebuza** has had a long and illustrious career in politics. He is the first man to enter the Mozambican presidency with a non-Marxist party programme and ideology and was re-elected in 2009 for a second five-year term of office.

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# University of Nairobi

## Excellence in Teaching, Learning and Research

The University of Nairobi, the premier institution of higher learning in Kenya, offers over 300 academic programmes spread over 3 faculties, 17 schools and 6 institutes. Like most dynamics institutions, the University faces challenges which it continues to systematically address within the context of its Vision and Mission. The University of Nairobi is committed to quality service hinged on the observance of the rule of law, skilled human resources, hard work, transparency accountability, fairness and timely service delivery in all units. Excellence in teaching, research and learning, good governance and management remains our focus. The current service charter is a commitment by the University of Nairobi to deliver high quality services to our students, staff, research collaborators, donors other stakeholders, and the public at large.

### Vision

A World-class University committed to scholarly excellence.

### Mission

To provide quality university education and training and to embody the aspirations of the Kenyan people and global community through creation, preservation, integration, transmission and utilization of knowledge.

### Colleges

- College of Agriculture and Veterinary Sciences
- College of Architecture and Engineering
- College of Biological and Physical Sciences
- College of Health Sciences
- College of Education and External Studies
- College of Humanities & Social Sciences

### Student and Staff Population

Currently the University of Nairobi has 63,846 students of whom 11,051 are postgraduates pursuing different degrees and diplomas both on a full-time and part time basis through the following modes: face-to-face, distance learning, e-learning and open learning. Students are served by a 2,052 strong academic staff and about 3880 technical, administrative and support staff. Today the University of Nairobi has the largest concentration of highly qualified scholars which constitute about 50% of professors in the country. It has been and continues to be a centre of intellectual life, a locus of research activities extending the boundaries of knowledge, a resource for professional development, and a key player in the growing global network of scholarship.

The institution has upheld the principle of equal opportunity for its workforce with regard to employment.

### Alumni

With over 145,824 strong alumnus, the University has an alumni association that is operational to tap benefits from its former students.

### Contribution

The University of Nairobi continues to contribute to the development of high-level human resources in the country and indeed the entire world. At the moment the university graduates over 12,000 graduands annually in a wide range of courses.

### Expansion of Infrastructure

The university has upgraded its infrastructure in order to cope with rising student admissions and the number of courses offered to realize its full potential. Some of its upgraded infrastructure includes teaching facilities, state-of-the-art laboratories, lecture theatres and a robust ICT Wing.

The University of Nairobi has remained the University of choice to many aspiring applicants to public universities and therefore admits the highly qualified applicants in disciplines such as medicine, pharmacy, dental sciences, veterinary and agriculture, law and Business among other disciplines.

### Admission Requirements

The admission requirements are set out and approved by the Senate. Admission is open to students from Commonwealth countries and beyond.



*Prof. George A.O. Magoha*  
Vice-Chancellor

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### Corporate Social Responsibility

The University of Nairobi runs an active social responsibility programme taking its services to the public. The university staff and students have participated in a massive tree planting exercise in order to conserve water towers in our country and environment in general. They have also continued to participate in community programmes such as medical camps, free dental check-ups, cleaning and assistance to children's homes, and helping the needy in society especially in times of disasters.







# Bridging the funding gap

# FINANCING AFRICA'S INFRASTRUCTURE DEFICIT THROUGH COOPERATION



**Mr. Rintaro Tamaki**, Deputy Secretary-General of the **Organisation for Economic Co-operation and Development (OECD)** underlines the need for collaborative and effective private investment in Africa's infrastructure.

Infrastructure development, which includes transport, water and sanitation, energy and information and communication technology (ICT), is critical for Africa's economic growth and poverty reduction. In particular, the current weak state of infrastructure is a major constraint to the continent's trade and access to global markets, as underlined by the joint Aid for Trade Initiative by the World Trade Organisation and Organisation for Economic Co-operation and Development (OECD). Unless more is done, there will be missed opportunities, since the growth potential of Africa is significant, despite the current global economic slowdown, with an expanding and educated middle class, a young population, enhanced connectivity through internet and improved governance in many of the countries.

At present, there is a major financing gap to fulfil the continent's infrastructure needs. According to the World Bank, the annual financial requirement for infrastructure in sub-Saharan Africa (SSA) is about US\$93 billion a year for both capital expenditures and maintenance. To finance this, only US\$45 billion is being mobilised, two thirds paid by African governments and citizens, 8 per cent by multilateral and bilateral donors and the rest by the private sector and emerging economies. This leaves a financing gap of close to US\$50 billion a year. But public expenditure of African governments cannot meet the significant needs, given the weak ability to mobilise revenue and other competing priorities. Official development resources are also unlikely to further increase in

a context of tightening budgets in countries that provide assistance. Private investment, however, offers some promising ways.

The importance of mobilising private investment for infrastructure in developing countries has been emphasised by the international community. For example, it is a key pillar of the G20 Development Working Group and its Multi-Year Action Plan on Development. Since 2011, successive G20 presidencies have highlighted investment for infrastructure as a key priority; and this will continue under the Russian G20 presidency for 2013. Furthermore, the Busan Partnership for Effective Development Cooperation as well as the Monterrey Consensus on Financing for Development



## Partners can help developing countries leverage private investment for infrastructure by strengthening the enabling environment and enhancing financial instruments. »»

also underlined the need for diverse sources of financing, including private investment, with the long-term objective of reducing aid dependence in achieving sustainable development. In addition, a number of Africa specific initiatives have been established, such as the Infrastructure Consortium for Africa launched by the G8, to which all G20 members have been invited to join, which acts as a platform for increasing financing commitments for Africa's infrastructure. In highlighting the role of regional cooperation, the African heads of state also endorsed a number of priority infrastructure projects, including private sector participation, at the African Union Assembly in January 2011, in Ethiopia.

### SUPPORTING THE ENABLING ENVIRONMENT

OECD has been engaged in a broad spectrum of activities to help developing countries increase private sector participation in infrastructure, in an effort to implement the organisation wide development strategy. Being a standard-setting organisation, OECD's value added is to share

relevant knowledge with non-member countries based on the experience of its members. As a multisectoral organisation, OECD can also enhance coherence and synergies with different policy communities from investment, finance, environment and development cooperation. Current activities include: assisting African countries to improve the policy framework for investment under the NEPAD-OECD Africa Investment Initiative; sharing principles for public governance of public-private partnerships; improving measurement of development related finance, including investments in low-carbon, climate-resilient infrastructure; analysing the bottlenecks to infrastructure development; and establishing guidance to improve development cooperation. Please see Promoting Pro-Poor Growth: Infrastructure and Private Sector Development; and Promoting Private Investment for Development: The Role of ODA for further information. It is also contributing to the G20 agenda on long-term financing for growth and development, which is key for investments in infrastructure.

Through these activities, it has become clear that development partners can help developing countries leverage private investment for infrastructure by strengthening the enabling environment and enhancing financial instruments to mitigate investment risks. Particularly in Africa, addressing the weak enabling environment that underpins infrastructure development is vital. This includes improving the policy framework, regulations that include tariff setting and procurement, and sound public institutions for the management of infrastructure systems.

In order to improve development cooperation to help Africa's enabling environment, OECD conducted a study on views and approaches by donor agencies. The study revealed some challenges and opportunities. It revealed some difficulties, such as aligning to country-led infrastructure plans in Africa due to the disconnect between country and regional priorities, lack of coordination and capacity among partner government ministries and regional communities, and inadequate country systems. Others pointed to obstacles in certain African countries such as political instability, unreliable legal frameworks and corruption. Particularly for fragile states, some donors saw peace and security as prerequisites for the enabling environment. On the other hand, several donor agencies stated that they were able to align well and effectively support their partner country's leadership and priorities.

## Many donors are in fact firmly engaged in various types of activities to help improve the enabling environment. »»

Many donors are in fact firmly engaged in various types of activities to help improve the enabling environment. OECD data showed that donor agencies allocated roughly 22 per cent of Official Development Finance (ODF) (which includes official grants and concessional and non-concessional loans) for helping improve the enabling environment of the African continent's infrastructure. The

support consists mostly of capacity building by deploying experts or training government staff in various stages of planning and operations. Although not all support to these ‘soft’ aspects is provided specifically to promote private investment, examples show that many activities have this aim, including for regional infrastructure.

## PROVIDING FINANCIAL INSTRUMENTS

On financial instruments to directly leverage private investment, especially development finance institutions (DFIs), international organisations and specialised government agencies use a wide range of tools that are often subsidised. They include investment

funds, blended grants and guarantees to draw in private investors who might otherwise be reluctant to invest in Africa’s infrastructure by mitigating the risks in bankable projects. In particular, guarantees as risk mitigants were championed by the G20 High Level Panel on Infrastructure Investment in its recommendations. Export credits, while primarily benefiting exporters from the providing country, can also have indirect benefits for project sponsors and buyers involved in infrastructure projects. Investment funds are usually set up by DFIs using official sources that are then managed by private companies who invest in funds targeted towards African infrastructure projects. As for blending, some bilateral donors are making use of this approach to combine concessional funding with financing from market-based sources.

## SUPPORT BY EU, AfDB, AND WORLD BANK FOR AFRICA’S INFRASTRUCTURE

The European Union–African Union Infrastructure Partnership has an Infrastructure Trust Fund (ITF), which blends grants from the European Commission and EU Member States with loans from the European Investment Bank, bilateral European financing institutions and others, reaching a total financing of over €2 billion for 35 regional infrastructure projects in sub-Saharan Africa. Projects are brought to the ITF for possible co-funding by accredited development finance institutions.

The African Development Bank (AfDB) is active in supporting regional infrastructure in Africa. It is the executing agent for the Programme for Infrastructure Development in Africa (PIDA), which serves as the blueprint for the development of the continent’s infrastructure, including investment strategies, priority projects and a framework for engaging with development partners. PIDA attempts to merge all the various infrastructure initiatives; namely the NEPAD Short Term Action Plan, the NEPAD Medium to Long Term Strategic Framework, and the African Union Infrastructure Master Plans; into one coherent programme for the continent. AfDB also houses several facilities, such as the NEPAD Infrastructure Project Preparation Facility and the African Water Facility. Furthermore, AfDB has an Enhanced Private Sector Assistance Initiative and Accelerated Co-Financing Facility for Africa, amounting to US\$1 billion over five years, which financed mainly infrastructure private sector operations on concessional terms through support from Japan.

The World Bank Group (WBG) has developed the Sustainable Infrastructure Action Plan, which outlines funding guidelines for the Bank’s infrastructure operations for 2009–2011. The Plan identifies four core activities: access to basic services; cross-sectoral linkages; mainstreaming sustainability; and scaling up WBG support and leverage. In addition, in response to the financial crisis, the World Bank launched the Infrastructure Recovery and Assets Platform to help governments minimise the negative effects of the financial crisis on their existing infrastructure projects and to provide additional financing for projects with liquidity problems. It also entails tailor-made advisory services for governments using stimulus packages to boost investment in infrastructure. Moreover, the International Finance Corporation of the WBG established an Infrastructure Crisis Facility in April 2009, which aims to bridge the financing gap for privately funded or public-private partnership funded projects in emerging markets that are facing financial distress.

Analysis indicates that there is significant aid fragmentation, with an excessive number of donors in many African countries’ infrastructure sectors, disbursing small amounts that increase transaction costs for the host government.

To measure the leveraging effects of development cooperation or financial instruments on private investment to Africa’s infrastructure is difficult. Firstly, there is lack of disaggregated data on these instruments as well as foreign

Countries	Ghana		Mozambique		South Africa		Tanzania	
Total annual ODFs by all donors for all infrastructure	US\$ 330 M		US\$ 275 M		US\$ 774 M		US\$ 537 M	
Sectors	Transport		Water & Sanitation		ICT		Energy	
Top Donors	Soft	Hard	Soft	Hard	Soft	Hard	Soft	Hard
1	AfDB	United States	Netherlands	EU Institutions	Finland	United Kingdom	World Bank	World Bank
2	World Bank	ADB	EU Institutions	United States	Korea	Korea	Sweden	United States
3	EU Institutions	EU Institutions	Australia	Netherlands	Japan	Norway	Japan	Norway
4	United States	France	United States	ADB	France	Germany	Norway	Japan
5	Japan	World Bank	Switzerland	United Kingdom	Germany	Canada	UNDP	Sweden

Figure 1. Top 5 donors of selected infrastructure sectors

Average annual 2009-2011 disbursements for ODF US\$ in millions - Source: OECD Creditor Reporting System

direct investment (FDI) due to confidentiality of commercial interests and other reasons. Secondly, financial instruments such as guarantees are also not easily captured, as they are not financial flows unless the guarantee is being called. Thirdly, it is hard to establish causal linkages, particularly since increased investment and sustainable infrastructure development can take time. In addition, broader issues such as the level of corruption or the state of the financial sector may impact more than direct support to the infrastructure sectors. Despite these challenges, OECD is currently undertaking a major exercise to better capture various development related finance, including guarantees and FDI. These efforts should help in gauging the leveraging effects of development cooperation on sustainable infrastructure projects in the near future.

### DONORS IN AFRICA'S INFRASTRUCTURE SECTORS

For Africa's infrastructure in general, the largest donors are the World Bank, EU institutions, AfDB (see their instruments in Figure 1), Arab Fund, Japan, Germany and France. These donors together provided more than 79 per cent of total ODF disbursements by all donors, excluding financing from the emerging economies. However, disaggregation of data by selected African Commonwealth countries for selected infrastructure sectors, as well as support for 'hard' (more for physical goods) and 'soft' (enabling environment, capacity building) aspects, shows a varied picture in terms of the largest donors (see Figure 1). For example, the US is among the top donors for both soft and hard transport aspects in Ghana. The same applies to the Netherlands for water and

sanitation in Mozambique; Finland and Korea for ICT in South Africa; and Sweden and Norway for energy in Tanzania. In other cases, Australia is a significant donor for the soft aspects and the UK for the hard aspects of water and sanitation in Mozambique, as well as Canada in the hard aspects of ICT in South Africa. These examples point to the strategic and selective focus of some donors amidst the overall dominance of the large multilateral organisations and other bilateral donors for infrastructure across the entire African continent.

According to the agreement in Busan, donors should support a country-led process by establishing common approaches, agreeing on lead development partners, and reducing aid fragmentation through a division of labour. However, analysis indicates

that there is significant aid fragmentation, with an excessive number of donors in many African countries' infrastructure sectors, disbursing small amounts that increase transaction costs for the host government. To address this, several bilateral agencies resort to multilateral organisations, special funds and multi-donor platforms that could minimise duplication, leveraging other donors' resources, building consensus, facilitating transactions, and disseminating good practices effectively. While this approach appears to reduce transaction costs, there is still need to be careful, as the G20 High Level Panel points out that the proliferation of these specialised programmes could also become another source of aid fragmentation.

“We believe that it is in all stakeholders' interest to collectively and collaboratively contribute to the ultimate goal of sustainable growth and poverty reduction.”

The issue of aid fragmentation and division of labour is becoming increasingly pertinent in Africa's infrastructure because of the rapidly expanding role of the emerging economies such as China, India, Brazil and the Arab countries. The active engagement of these economies in Africa's infrastructure sectors reflects their own focus on developing

infrastructure domestically as part of their growth strategies. Some estimates suggest that China has already outpaced the World Bank as the leading funder of Africa's infrastructure. In this new reality, it is critical to account for non-traditional development partners' contributions when tracking development finance for infrastructure.

### SUPPORTING AND FACILITATING REFLECTION

OECD's expertise in collecting and monitoring official development finance statistics should facilitate the integration of those non-traditional donors into the donor community. What is more, as these economies tend to provide significant financing mostly for the 'hard' aspects of infrastructure, OECD members and multilateral organisations would need to rethink their respective strategic focus, comparative advantage, complementarity and division of labour. OECD is supporting and facilitating this reflection through enhanced dialogue and partnerships with African governments, the private sector, donor agencies, other international organisations, development finance institutions, civil society as well as emerging economies. We believe that it is in all stakeholders' interest to collectively and collaboratively contribute to the ultimate goal of sustainable growth and poverty reduction in Africa.

**Mr. Rintaro Tamaki** is the Deputy Secretary-General of the OECD, responsible for the strategic direction of work on environment, development, green growth, financial affairs and taxes. Prior to joining the OECD, Mr. Tamaki was Japan's Vice-Minister of Finance for International Affairs. During his prominent 35 year career, he worked on various budget, taxation, international

finance and development issues. He was posted to the World Bank as Alternate Executive Director for Japan as well as Finance Minister at the Embassy of Japan in Washington DC. He has published books and articles on international institutions, the international monetary system, development, debt and taxation.

**The Organisation for Economic Co-operation and Development (OECD)**, founded in Paris in 1961, is an international organisation of 34 countries committed to democracy and the free market economy. It provides a platform to compare policy experiences, identify good practices, and coordinate domestic and international policies in multiple areas from economy, development, investment, trade, finance, taxation, science and technology, health, education, and so on. In implementing the OECD Development Strategy, it is increasingly sharing knowledge with non-members and ensuring that member policies are coherent with the objective of supporting developing countries' efforts in meeting the Millennium Development Goals.

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*The article was largely based on the report, Mapping Support for Africa's Infrastructure Investment, OECD, 2012. [www.oecd.org/daf/inv/investment-policy/MappingReportWeb.pdf](http://www.oecd.org/daf/inv/investment-policy/MappingReportWeb.pdf)*



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# INNOVATIVE THINKING TO MEET AFRICA'S INFRASTRUCTURE NEEDS



**Gilbert Mbesherubusa** of the **African Development Bank** considers less traditional financing methods for Africa's infrastructure needs, and calls for a range of efficiencies and leverage to supply the required investment.

With growth prospects close to 6 per cent for 2013 – second only to that of Asia – after a decade of strong economic growth, the expectations of African people are high. Providing wider, equal access to basic infrastructure (transport, power, water and sanitation as well as broadband and telephony), and enhancing economic integration of small and landlocked African countries will help accelerate growth and reinforce Africa's capacity to ensure equal opportunities and benefits for all actors in society. Infrastructure improvement in Africa will promote inclusive growth – a growth that benefits all.

Yet, if infrastructure development is a key to Africa's future, the investments needed to tackle the huge infrastructure gap are so high that

traditional sources of finance will not be sufficient. The time has come for innovative solutions to mobilise additional resources for Africa.

Infrastructure is at the core of inclusive growth, a growth for all, a growth that creates jobs, reduces inequalities and offers opportunities to African citizens. African countries cannot expand education opportunities for youth and provide jobs without access to electricity, broadband and connectivity. Food security and agricultural value chain development cannot be achieved without access to reliable transport infrastructure that will help in reducing post-harvest losses. Africa's growing cities would be uninhabitable without clean water, adequate sanitation, reliable and affordable electricity supply and mass transit systems.

That is why the African Development Bank (AfDB) has been dedicating – and will continue to do so – almost 60 per cent of its resources to infrastructure development in Africa. During the past seven years, the AfDB has significantly scaled up commitments to African economic integration, transport corridors, power pools, trade facilitation and financing of regional public goods.

Over the past five years, the AfDB has committed close to US\$13 billion to infrastructure. But that is a drop in the ocean, for a gap identified as US\$48 billion per annum and unlikely to be closed by traditional funding. Over 60 per cent of Africans are not connected to electricity, two-thirds of the region's rural population have no access to all-weather roads, and 95 per cent of agriculture is

rain-fed. Although 65 per cent of the continent's population has access to clean water, only one person in three enjoys improved sanitation.

### AFRICA'S CHANGING LANDSCAPE

Africa's landscape is changing rapidly, and with the changes have come new developments that are driving Africa's infrastructure demand.

First, Africa's diverse range of natural resource reserves, from mineral wealth to arable land, require large investments in infrastructure (energy, water, transport and ICT) in order to catalyse and optimise their exploitation, including the necessary infrastructure and logistics supply chains to facilitate efficient export of products to regional and international markets.

Second, the growth of intra-African trade – which has more than doubled in the last eight years from US\$49 billion in 2005 to US\$108 billion in 2011, according to the *Development Effectiveness Review* published by the AfDB in 2012 – is placing even heavier demands on the continent's infrastructure systems, particularly trade corridors and logistics supply chains.

Third, Africa's population surge (from 1 billion today to 1.6 billion by 2060, with nearly half under 17 years of age) will put considerable pressure on infrastructure systems, requiring corresponding investments in social infrastructure and services such as water, sanitation, education, health and communications, notwithstanding the huge job creation that surge should involve. This population increase, linked to high and rapid urbanisation (about 40 per cent of the African population is now urbanised), has put pressure on existing infrastructure, necessitating new investments in mass-transit systems, water supply

and waste management, and related environmental services to respond to the diverse needs of this growing urban population.

Of course, high population increases will entail up-scaling food production, which is only feasible with requisite investments in agriculture and agro-infrastructure such as dams and irrigation systems, storage, warehousing and distribution.

Projects aimed at improving train speed could trigger important private sector investment decisions.

A billion-inhabitant continent, with an increasingly favourable macro-economic environment, strong economic growth, a growing middle class and strengthened governance, has led to a change in the perception of Africa's risk profile, resulting in increased investment appetite for the continent.

Finally, there is a growing acknowledgement that infrastructure development can help to move countries from conflict to cooperation, as is the case with the Mano River Union (MRU) comprising Liberia, Sierra Leone, Guinea and Ivory Coast. Indeed, neighbouring countries with a mutually beneficial stake in each other's economies are less likely to undermine each other's stability; and regions can prevent conflicts from spilling over by working jointly on the social, environmental

and economic stresses that affect their populations.

### SECURING LONG-TERM RESOURCES

Africa is faced with the challenge of securing more long-term resources for infrastructure development. Traditional funding sources – development partners, bilateral and multi-lateral donors as well as international finance institutions – estimated to contribute US\$46 billion per annum, are inadequate to address Africa's large infrastructure financing gap. Donor countries are facing domestic economic challenges which will take time to fix. As a result, development finance has declined for the first time in 20 years in real terms, and is very likely to continue shrinking for the coming years. Therefore, there is a need to tap into non-traditional sources through harnessing Africa's domestic resources.

Much has been said about the untapped potential of Africa's domestic resources, about their ability to close the financing gap for Africa's infrastructure; real progress, therefore, would be made by finding ways for Africa to mobilise these resources. Several avenues could be explored.

According to figures from the Retail Banking Africa conference which convenes each year in Johannesburg, close to 80 per cent of Africa's adult population is unbanked, representing a total of 326 million adults. Banking the unbanked has the potential to bring into the banking sector three to five times what is available at present. The deposits commercial banks could collect could channel huge amounts of money for private sector initiatives, including for the infrastructure sector.

Africa's private sector is ready to invest massively in infrastructure if there is an economic interest

in doing so. For instance, in East Africa, a number of traders in need of an efficient railway service have expressed interest in investing in Uganda–Kenya railways, provided improved quality of service is guaranteed. The rail infrastructure and rolling stock has deteriorated over the last 20 years due to a lack of maintenance; locomotive speed has been held at some 8–10 km/hour on badly worn stretches of track, in order to avoid derailments. Wagon turnaround time between Mombasa and Kampala (a distance of some 1,200 km) has doubled from 14 to 28 days, and the share of port freight on rail has diminished to below 6 per cent – while road transport, much more expensive, is monopolising freight. Projects aimed at improving train speed could therefore trigger important private sector investment decisions.

The example of the Uganda–Kenya railway system clearly shows that the paucity of infrastructure

is the biggest single long-term constraint on Africa’s private sector investments in Africa’s economy.

In the same vein, we should not underestimate the existing inefficiencies in the African infrastructure sector. According to the findings of a recent independent report, the *African Infrastructure Country Diagnostic* (AICD), commissioned by a consortium of bilateral and multilateral donors including the AfDB, addressing a wide range of inefficiencies could leverage as much as US\$17 billion a year. This is Africa’s major infrastructure efficiency gap, concludes the report.

The AfDB has been a pioneer in infrastructure development on the continent. Today, maybe more than ever, the African Development Bank is exploring new avenues for innovative infrastructure finance. Not only has the AfDB both provided financing and played a catalytic role in mobilising finance from sister organisations and private financial institutions, it is now considering, in partnership with African institutional investors, the establishment of an African funding facility which would be innovative in its design and structure, leveraging infrastructure financing from a wide array of sources, including African central bank reserves, sovereign wealth funds and pension funds.

Collectively these sources constitute a quantum pool of capital which the continent could tap for infrastructure investment. At current estimates, a level of up to 5 per cent of these resources would immediately yield a significant sum that could be channelled into financing existing infrastructure needs. For example, a portfolio allocation of up to 5 per cent of African central banks’ foreign exchange reserves, estimated to be approximately US\$500 billion,

would yield up to US\$25 billion into the proposed facility. Addressing the practicalities and mechanisms through which such a proposal could be brought to fruition is the subject of the work that is currently under way by the AfDB and its partners.

**Gilbert Mbesherubusa** is the Vice-President for Infrastructure, Private Sector and Regional Integration of the African Development Bank. As an Africa specialist with sound practical knowledge of the continent’s infrastructure needs, Mbesherubusa is leading a strategic Vice-Presidency which accounts for more than 70 per cent of the African Development Bank’s commitments over the period 2007–2012, to the tune of some US\$27 billion (compared to a total of approximately US\$39 billion for the entire bank).

**The African Development Bank Group** (AfDB) is a multilateral development finance institution established to contribute to the economic development and social progress of African countries. Founded in 1964, the AfDB’s mission is to fight poverty and improve living conditions on the continent through promoting the investment of public and private capital in projects and programmes that are likely to contribute to the economic and social development of the region. The AfDB is a financial provider to African governments and private companies investing in the regional member countries.

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### DIASPORA BONDS

While it is widely known that with about 30 million Africans living outside their homelands (some 16 million in high income countries), migration is a vital lifeline for the continent, African governments need to do more to realise the full economic benefits of the phenomenon. A joint report by the African Development Bank and France, issued in 2012, has identified a series of financial and regulatory innovations with a view to mobilising the savings and expertise of nationals living abroad to work for development, strengthen the financial systems and economies of the countries of origin, and integrate them more into the global economy. In that regard, diaspora bonds could potentially raise up to US\$28 billion annually.



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# CREATING A FAVOURABLE INVESTMENT CLIMATE IN ZAMBIA



**His Excellency Michael Sata, the President of Zambia,** outlines how his government is committed to making the country increasingly attractive to domestic and foreign private investment through improvements in infrastructure.

I wish to welcome you to the CBC Africa Infrastructure Investment Report 2013, which provides an effective platform for government agencies to outline their priorities, showcase forthcoming developments and make a call for partnership and investment. The report also offers the private sector an excellent tool to promote their services, expertise and solutions to a reactive audience of senior government and public sector decision makers.

The aim of my government is to continue with policy and institutional reforms with the key objective of making the country more attractive to domestic and foreign private investment. The achievements recorded in Zambia's investment climate are underpinned by two major reform programmes, namely the Private Sector

Development Reform Programme (PSDRP) and the Millennium Challenge Account (MCA).

While the PSDRP addresses the country's key challenge of reducing the cost of doing business through legislative and institutional reforms, the MCA is premised on addressing issues relating to transparency and good governance. The country has one of the highly liberalised economies in the sub-Saharan African region, with legislation to ensure that investors can freely invest in any sector of the economy. Investors are entitled to various investment incentives with non-restricted participation by non-residents on the Lusaka Stock Exchange since the Securities Act of 1993, and guaranteed protection for foreign investment under an agreement between an Overseas

Private Investment Cooperation (OPIC) and Zambia in June 1999, and the Multilateral Investment Guarantee Agency.

“Investors are entitled to various investment incentives with non-restricted participation by non-residents.”

The domestic economy's macroeconomic fundamentals are strong, as reflected by low and single digit inflation, broad based economic growth averaging 6.4

per cent over the last five years, stable exchange rate and growth supportive fiscal performance. Transparency, good governance and the fight against corruption has been one of my government's top priorities.

## 66 Government has prioritised the improvement and development of economic infrastructure. 99

These efforts and developments greatly contributed to Zambia recently being rated 'B+' in the sovereign credit rating by Standard & Poor's and Fitch. Furthermore, over the years of committed business reforms evidence of a favourable and improving investment climate has been observed, with the country's World Bank Doing Business ranking being favourable.

### IMPROVING INFRASTRUCTURE

My government is committed to investing heavily in Zambia's economic infrastructure, hence our entry into the capital market where we successfully raised development finance for this purpose. I am proud to say this reflects the high confidence the international investor community has in our country as a safe and preferred investment destination.

The government's continued effort to promote economic growth and development has in the past been severely hampered by the absence and in some cases inadequate and

poor economic infrastructure, particularly roads, rail and power generation capacity. To address these concerns and to reduce costs incurred by the productive sectors of the economy as a result of inadequate and poor infrastructure, my government has prioritised the improvement and development of economic infrastructure.

Accordingly, the government launched the Link Zambia 8000 Project in October 2012. The project, also known as the Accelerated National Road Construction Programme is aimed at the construction of roads in the country. The objective of the initiative is to encourage growth of the local contracting industry, reduce cost and transit time of road users across the country, generate economic growth centres and above all transform Zambia into a land-linked country.

In addition, the government aims to create 24,000 new jobs during the duration of the initiative. Over a five year period a total of 8,201km of road will be constructed or rehabilitated, with 37 roads in all 10 provinces upgraded to bituminous standards with double surfacing or asphalt concrete. This development is important because roads play a critical role in economic development by facilitating movements of goods, domestically and within the region.

Rail transport still remains one of the most efficient forms of transporting bulk and time sensitive commodities such as copper. In addition, an efficient railway system also helps to prolong the life span of the road network. As a result, my government will invest some of the proceeds from the inaugural Eurobond amounting to US\$430 million on road and rail infrastructure. Improvements in

transport infrastructure will lead to better access to markets and services, greater reliability and lower costs.

### WORKING WITH STRATEGIC PARTNERS

There has been a general complaint from the public, commerce and industry about the challenges posed by the energy sector, particularly the frequent disruptions of power supply. In this regard, the government intends to enter into public-private partnerships to increase installed power generation capacity as well as transmission and distribution infrastructure. Towards this aim, the government is working with strategic partners to develop the Itezhi-Tezhi and Kafue Gorge Lower power stations and complete the extension of the Kariba North Bank Power Station, among other projects.

## 66 The government intends to enter into public-private partnerships to increase installed power generation capacity. 99

In consequence, ZESCO is set to complete the expansion of the Kariba North Bank Power Station by the end of 2013, while works on Itezhi-Tezhi have commenced. An additional 300 MW Thermal Power Plant is being constructed by Maamba Collieries Ltd. These projects once completed will enable the country to improve its generation mix from 99 per cent



hydro based to just over 60 per cent hydro based by 2015.

Progress has been made in access to water in rural and urban areas over the recent past. Projections suggest this trend will be sustained and improved upon in coming years. Greater investments in infrastructure and the human resources capacities of providers could enable the country to expand coverage and enable access to clean water for the majority of the population.

The intention of my government is to provide safe and reliable water and sanitation services in both rural and urban areas. This will be done through the rehabilitation and construction of boreholes in rural areas and the development and rehabilitation of water supply and sanitation infrastructure in urban areas. The government will

also strengthen the capacity of water utility companies and other sanitation institutions in water and solid waste management.

Over the medium term, the government will facilitate the construction of low cost housing in order to narrow the current housing deficit. In addition, my government will construct institutional houses for the education and health sectors in particular.

Infrastructure development is fundamental for the economic growth of any country due to its direct impact on economic activity. I therefore urge you to consider investing in our country and partnering with us in developing and rehabilitating our infrastructure, which will improve our productive sectors and create employment for our people.

**Mr. Michael Chilufya Sata** became President of the Republic of Zambia following the September 2011 General Elections. He is the fifth President of Zambia since the country gained independence from Britain in 1964. Before that, he had spent 10 years in opposition, building the PF from scratch into one of the most formidable political parties in the country.



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# A NEW PHASE IN GLOBAL PROJECT FINANCE



**Geoff Haley**, founder and Chairman of **The International Project Finance Association (IPFA)**, welcomes the arrival of new initiatives and techniques to turn infrastructure projects into bankable investments.

In 2008, the collapse of Lehman Brothers triggered the collapse of bank lending to project finance deals, financial institutions stopped lending to each other, the cost of lending soared and the availability of credit in the market substantially decreased. Often described as the Great Financial Crisis, its effects remained with us in 2013.

Initially, many saw the upset in the project finance market as a temporary situation and looked forward to the resumption of business as usual a few years later. As many of the pioneer banks of the private finance initiative (PFI) continued to exit the market (RBS, Bank of Scotland, etc.) it demonstrated a fundamental change in the market.

The opportunity to fund public-private partnership (PPP) projects

at 100 to 125 basis points above the London Interbank Offered Rate (Libor) had gone for the foreseeable future. Funding for the M25 motorway project in the UK in 2009 demonstrated the problem, when the cost of debt soared to 250 basis points above Libor in the early years, rising to 350 basis points above Libor in years 11 to 27.

## CONVENTIONAL STRUCTURES NEED CHANGE

The substantial increase in both the cost of equity and the cost of debt was discussed in some detail at the Commonwealth Secretariat Roundtable Discussions in May 2012 in London. The conventional structure of expensive equity and highly leveraged inexpensive debt was not now available. The equity costs plus increased lending costs

made projects difficult enough to do in developed countries but they became unaffordable in emerging markets.

It was accepted that the debt market would not improve because of the number of banks leaving the market, banks strengthening their balance sheets, and the effects on the sector of the new Basel III banking rules, which govern capital and liquidity standards.

Basel III will have a radical impact on the banking market by increasing the capital required to protect against losses and forcing banks to match tenors of assets and liabilities. It was accepted that the conventional model cannot now be maintained, and the resultant cost of the output is not affordable to the user – or the public sector – if

in fact they pay for the services through user fees.

2012 has been a time for reflection on how project finance can move forward in the future. The UK government has reassessed the current PFI model and found it inadequate for future projects. In the new model, PF2, we shall see the opportunity for the public sector to contribute equity alongside the private sector; in addition, more emphasis is placed on value for money for the public sector and an improved and speedier procurement system.

### NEW INVESTMENT INSTRUMENTS

At the same time, institutional investors have been looking for alternative instruments in which to invest as sovereign debt yields have fallen.

We have seen a number of new initiatives floated. PEBBLE is one which is out for consultation on the IPFA website [www.ipfa.org](http://www.ipfa.org). Others include the Hadrian's Wall credit enhancement product, and the European Investment Bank (EIB) project bond.

Pension and similar funds are being encouraged globally to become substantial investors in infrastructure. At present many funds have concerns on how they manage their investments and how they assess and quantify risks in individual projects. 2013 will see the development of structures and vehicles to help them overcome these issues.

### SPECIAL CONSIDERATIONS FOR AFRICA

In the African context we need to address some additional issues. The World Bank has estimated that infrastructure has been responsible for over 50 per cent of Africa's recent growth performance, and the cost of addressing Africa's

### ONLINE INFORMATION SOURCES

Infrastructure Journal (IJ) is an online information resource that tracks global market activity to deliver real-time news, insight and data to underpin investment decisions ([www.ijonline.com](http://www.ijonline.com)).

**TFI-News** reports on privately financed global transportation projects – greenfield and asset acquisitions – and produces video interviews with key PPP sponsors, developers, investors and procuring authorities to discuss and highlight key PPP markets, transactions and market developments ([www.tfi-news.com](http://www.tfi-news.com)).

**Public Works Financing** newsletter is the journal of record for public-private partnerships in North America, delivering timely and pertinent news of innovative financial structures and alternative project delivery of public works infrastructure projects (<http://pwfinance.net>).

**Infrastructure Investor** is a magazine and online service providing detailed coverage of infrastructure finance and investment globally. It meets the information needs of funds, financial institutions, governments, developers and other specialists ([www.infrastructureinvestor.com](http://www.infrastructureinvestor.com)).

**PPP Bulletin International** is a subscription news website providing in-depth updates on international PPP legislation, regulation, working procedure and market potential ([www.pppbulletin.com](http://www.pppbulletin.com)).

infrastructure needs is around US\$93 billion per year. Even if major potential efficiency gains are captured, African countries still face a US\$31 billion annual funding gap. Power is the largest infrastructure challenge, with 30 countries facing regular shortages.

It is generally accepted that inadequate and defective economic and social infrastructure impacts adversely on economic growth. To achieve continued economic growth, African countries have to attract private sector investment into energy, transport, health and education.

The economic and social infrastructure in many parts of Africa is huge and growing. Many projects brought to the market are simply not 'bankable' – they have flawed business cases, unacceptable risk profiles and have imprecise outputs or outcomes. As the use of new financial and legal structures in 2013 will hopefully release new

investment across many European countries, likewise 2013 is the time for African countries to take a fresh look at the preparation of their projects before going to the market to attract PPPs for infrastructure investment.

Project financing is now a global expertise, and projects in all countries have to conform to international best practice to attract both equity and debt. In addition, acceptable and bankable risk profiles (risks shared between the public and private sectors) have been negotiated in every country and every sector and are now clearly identifiable.

Governments have to recognise that there are global current funding and capital constraints, and to attract investment for infrastructure they have to make their projects attractive financially, with a clear and fair risk profile coupled with a speedy procurement procedure.

**Geoff Haley, LL.B, MBA, CIM**

is the founder and Chairman of IPFA. He is a lawyer specialising in project finance, public-private partnerships and construction both in the UK and overseas. He has specialist expertise in large and complex projects in the fields of energy, waste management, water treatment, transport, healthcare and education. Projects include Channel Tunnel; Channel Tunnel Rail Link; UK DBFO Roads; Jordanian BOOT Projects; Tbilisi City Water; Belfast Courts; Government Accommodation Projects. He is honorary Professor and visiting lecturer to the University of Dundee and visiting Professor to Metropolitan University, London. His books include *A – Z of BOOT*.

**The International Project Finance Association (IPFA)**

has become the project finance industry's global trade association. It is dedicated to promoting and representing the interests of private sector companies and public sector organisations involved in project finance and public-private partnerships throughout the world. As an international, independent, not-for-profit association, established in 1998, the IPFA aims to raise awareness and understanding about project finance and PPPs and their crucial role in infrastructure and economic development. The Association's principal objectives are to encourage networking and dialogue between the public and private sector, to provide up-to-date information on best practice, industry trends and

new developments that can be immediately applied to projects. The IPFA performs research through the establishment of working committees and steering groups to examine key issues and concerns facing the industry, and to produce recommendations and responses to consultation papers. It also designs and conducts training programmes for governments, public sector bodies and private sector companies across the world.

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Treasure Capital & Trusts Limited ["TC&TL"] is a global financial services company incorporated on January 2, 2009 under the Company and Allied Matters Act 1990 and licensed/regulated by the Securities & Exchange Commission to render investment banking services.

**STRATEGIC MISSION**

Redefining standards through first-class and unbeatable financial service delivery, with creative and bespoke solutions that meet our clients' needs.

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- |                                  |                                 |                                     |
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| • Commodities & Currency Trading | • Government Securities Trading | • Investment Advisory Services      |
| • Issuing House Services         | • Treasury Management           | • Debt Structuring & Re-Structuring |
| • Infrastructural Financing      | • Training & Consultancy        |                                     |

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- ✓ TC&TL trade in the major currencies in the world with an annual trading volume of \$1.5Billion
- ✓ TC&TL are the sole accredited agent supervising FXCM (world's largest FX trader) clients and trading platforms in Africa.
- ✓ TC&TL have participated in a number of large and complex public and private capital market transactions.

# EUROPEAN PRIVATE SECTOR INVESTMENT IN AFRICA



**Bruno Wenn**, Chairman of the German development finance institution, **DEG**, illustrates private sector investment from Europe in African infrastructure projects.

Since the start of the millennium and following almost two decades of low growth rates, economies in sub-Saharan Africa have been gathering momentum. Africa is the only region that will probably grow faster in 2013 than in the year before. The major reasons for this upward trend are two-fold. Firstly, the framework conditions have improved. Despite a few exceptions, more and more African countries are increasingly characterised by good governance, political stability and an enabling environment, which encourage investments. Secondly, increasing external demand for African commodities has boosted growth. Combined with a considerable expansion of the service sector, and particularly the financial sector, growth is on a broader and sounder footing. The lion's share

of this growth stems from private sector development.

## EUROPEAN INVESTMENT

While investors from emerging market countries in Latin America and Asia have already seized the opportunity to invest in Africa, German and other European companies are evidently more risk conscious. Despite doubtlessly offering opportunities, Africa still faces challenges. Private sector development can play a vital role here through creating employment opportunities, reinforcing the upward spiral of positive growth.

Poor infrastructure and a lack of access to finance act as a brake on both a growing private sector and poverty alleviation in Africa. However, a one-off investment in infrastructure is simply not

enough to trigger further positive economic development. Much more importantly, infrastructure has to grow in line with production and its changing requirements. Often transport and energy capacities, for example, lag behind the growth rate in Africa, undermining growth potential.

## PRIVATE SECTOR INVOLVEMENT

The provision of infrastructure has traditionally been a public sector responsibility. Private investors can, however, also make a valid contribution in this area. Cooperative projects, such as the one between the German development finance institution DEG – Deutsche Investitions- und Entwicklungsgesellschaft GmbH – and the Emerging Africa Infrastructure Fund (EAIF),



illustrate the increasing importance of projects driven by the private sector. EAIF finances infrastructure projects in countries such as Nigeria, Cameroon, Uganda and Kenya. To date the fund has made investments in private sector infrastructure projects with a total volume of some US\$620 million in over 30 private enterprise projects, with half of these projects financed in parallel by DEG. Energy supply and telecommunications are two of the priority sectors. This includes renewable energy such as water or geothermal power.

## PROJECT EXAMPLES

### Climate protection in Kenya

One example is Olkaria III, a climate protection energy project in Kenya. DEG provided Orpower, the owner and operator of the geothermal power station Olkaria III in Kenya, with a long-term loan to the amount of US\$40 million. In addition, DEG structured and arranged the complete debt financing of US\$105 million.

Olkaria III takes a pioneering role in the utilisation of geothermal energy and is the first geothermal power project in Africa. By virtue of projects like this, the private sector is contributing to more efficient, cost-effective and sustainable production of electricity – and in countries where power cuts are a predictable daily occurrence. The way has been paved for subsequent investors.

### Electricity generation in Senegal

A considerable portion of DEG's new business goes into the development of private infrastructure projects, with renewable energy projects playing an increasingly important role. Since 1995, DEG has co-financed a number of wind, smaller hydropower and biomass projects worldwide. In 2010 alone, DEG committed about €230 million

## SERVICES OFFERED BY DEG

The amount and type of DEG's financing contributions are dependent on the structure of the financing, project and partners and, as a rule, cover up to one-third of the relevant total investment volume. Expansion and modernisation investments may be co-financed by up to 100 per cent. The financing terms and conditions are market-oriented.

DEG's current portfolio of more than €5.6 billion (US\$7.5 billion) has contributed to an overall investment volume of around €39 billion. The volume of DEG's Africa portfolio is around €1 billion spread over 118 companies in 28 countries.

**Long-term loans.** The borrower is generally the company in the developing or emerging market country. If the company in the partner country constitutes a financially independent unit, material securities or guaranties of the parent company will, as a rule, not be required. The loans are firstly collateralised in the fixed assets of the project company abroad. Collaterals include liens on real estate and movable assets, security transfers of assignments of titles.

**Mezzanine finance.** The service of interest and repayment of mezzanine finance is subordinated to senior loans. Besides a fixed interest rate, a profit-dependent share is frequently agreed as compensation for the higher risk. As a rule, mezzanine finance is considered quasi-equity by senior lenders. This type of financing combines the advantages of equity on the one hand, and the tax deductibility of interest on the other.

**Equity participation.** DEG's stakes in the equity of companies in partner countries are always minority participations. They are of particular interest whenever the entrepreneurial risk is to be split up, or the reputation of DEG as a co-shareholder is required. This also applies when the shareholders do not wish to cover the equity requirement on their own or – e.g. for reasons of legislation in the investment country – are unable to do so; or when they need to have an additional partner among the shareholders in the company in the partner country (e.g. in the case of joint ventures). A vital prerequisite for DEG's participation are return expectations commensurate with the risks, and realistic exit prospects for the DEG share within a period of four to ten years. This can be realised by means of the partner's takeover commitment (put or call options), IPO or sale to third parties.

**Guarantees.** If an investor in the investment country wishes to raise a loan in local currency, the local financing may be secured by a DEG guarantee.

(more than US\$300 million) for new projects.

Another pilot project in the field of sustainability and renewable energies is a DEG-supported cooperative arrangement by Stadtwerke Mainz, the municipal utility of the German city of Mainz, and the community of Kalom

in Senegal, which has started profitable electricity generation from renewable energy. Within the framework of the project, a biomass power plant with pyrolysis technology was established in order to supply a rural community with electricity. The project was financed by the foundation Energy for Africa, set up by Stadtwerke Mainz.

DEG complemented this amount from funds of the 'develoPPP.de' programme of the German Federal Ministry for Economic Cooperation and Development (BMZ).

On the ground, the project was implemented by the south German company Novis, which specialises in electricity from biomass. The company supplied the technology for the biomass power plant, which mainly uses peanut shells and millet stalks as sources of renewable energy. The biomass supply is mainly covered by local smallholders, which improve their income by providing the 'Dorfwerk' (village plant or facility) with the basic requirements. The remaining biomass needed can be obtained from a larger groundnut oil producer. At the core site, the power generated by the plant is distributed via a so-called island network. Households in remote areas are able to operate two to three electric lamps and one additional device via micro solar systems.

For the operation of larger electrical appliances, a charging station is available at the core site, which offers renting and recharging of batteries. Since May 2012, an operator company is responsible for the power plant. The foundation Energy for Africa, as well as about a dozen villagers, hold shares in the company. A total of seven local workplaces were created in the Kalom Mainz Industries facility. These local employees had been thoroughly trained by Novis to operate the plant autonomously. The village community has been made familiar with the use of electricity.

### COVERING AFRICA WITH A MOBILE PHONE NETWORK

DEG has also been engaged in pioneering investments in telecommunication. In 1998, the electrical engineer and former Technology Director at British Telecom, Mohammed Ibrahim,

had the vision of constructing a mobile telephone network in Africa. He planned to connect every city, every village and every slum to the network. After purchasing his first licences, Ibrahim needed capital for his company, Celtel, which was a start-up with huge initial expenses in a market that was not yet established. Ibrahim had a tough time finding investors for the risky project that would run into the billions. Normal commercial banks deemed it too risky. DEG, however, recognised the opportunity for Africa, and in 2001 invested in his company.

“Africa needs many more such cooperative enterprises if its problems are to be overcome.”

Celtel, now known as Airtel, has become a real success story and contributed to an African modernisation push, as the continent experienced a development known as leap-frogging. Providers did not bother to introduce fixed line networks, but simply skipped one step in telecoms development by directly focusing on mobile phones, thanks to Celtel and DEG. Today, the African mobile phone market is considered to be the world's fastest growing market. Equipment and SIM cards are, compared with European prices, moderately priced and even affordable for people with little money – and therefore a real economic revolution has started. To mention a few examples, taxi drivers can be contacted, farmers can notify the delivery of merchandise to their vendors, kiosk owners can order

supplies, and traders can give orders by telephone. In 2008, Africa had already passed Northern America in the number of cellphone users, and numbers are still rising.

Whether it is mobile phone pioneer Celtel or energy supply from renewable energies, Africa needs many more such cooperative enterprises if its problems are to be overcome. DEG has been helping realise such deals for half a century. The alliances depend on people on the ground – entrepreneurs and investors.

**Bruno Wenn** is Chairman of the Management Board of DEG. Before he started working at DEG in 2009 he was KfW Bankengruppe's Head of Division for Financial Cooperation with sub-Saharan Africa.

**DEG – Deutsche Investitionen und Entwicklungsgesellschaft GmbH**, Cologne, Germany – is a subsidiary of KfW Bankengruppe, specialising in conceptual support and long-term financing of investments in developing and emerging market countries. In particular it provides long-term finance with a focus on financing fixed assets of subsidiaries of German companies, joint ventures and local companies by means of equity participations, mezzanine finance, long-term loans and guarantees. The projects need to be profitable, environmentally and socially compatible and must have a sustainable development effect.

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# THE UNITED REPUBLIC OF TANZANIA

## MINISTRY OF FINANCE



### Welcome Message

Dear readers of the Commonwealth Business Council Africa Infrastructure Investment Report, it is my pleasure to welcome you to this particular section which is featuring the information about the Ministry of Finance in the United Republic of Tanzania.

I'm very proud for my ministry and country to be part of this important and prestigious publication. It is my belief that regular readers of this publication will be able to explore information they need about one of the blessed countries of East Africa.

Whether you are a citizen or business owner seeking information on taxes, credits and financial management, or an investor interested in our diverse and stable economic and fiscal climate, I encourage you to explore more about our ministry and country in various publications and websites such as [www.tanzania.go.tz](http://www.tanzania.go.tz) and [www.mof.go.tz](http://www.mof.go.tz)

For foreign investors and the international community, on behalf of the people of the United Republic of Tanzania, I would like to take this opportunity to welcome you all to Tanzania, the land of Zanzibar, Kilimanjaro Mountains, Selous, Mikumi, Serengeti and Ngorongoro Wilds Parks and, more importantly, the land of friendly and peace-loving people.

Yours Sincerely,

Dr William Mgamwa MP, Hon. Minister of Finance

### AN OVERVIEW OF THE MINISTRY

The Ministry of Finance manages the overall revenue, expenditure and financing of the Government of the United Republic of Tanzania. In so doing it oversees national budget preparation and its execution. Through its monetary and fiscal policies, the ministry is responsible for the macroeconomic stability and general development in the country. The ministry

is also concerned with the performance of the Tanzanian economy through international trade. Given the ministry's wide-ranging advice and policy role, ministry officials work closely with officials in other ministries, agencies and departments to ensure that the Government's overarching poverty reduction strategies are implemented and objectives attained.



## SHORT/LONG TERM OBJECTIVES

The ministry is the custodian to the implementation of Mkukuta, which is the National Strategy for Growth and Poverty reduction in the country. While Mkukuta is the short term strategy, the National Vision 2025 provides strategies for long-term objectives of the nation. Tanzania's development path is clearly articulated in the Tanzania Development Vision 2025. To ensure the Vision 2025 is realized as envisaged, Tanzania is now, alongside Mkukuta, implementing a series of Five Year Development Plans aimed at unleashing the country's latent growth potential. This focuses on infrastructure development, agriculture in terms of modernization and knowledge, industrial development, human capital and skills development, and tourism, trade and financial services. The core objective of the Vision is to graduate to a status of a middle-income country, with high attributes of human development by the turn of the first quarter of the twenty-first century. The National Development Vision 2025 has the following attributes:

- Increase the pace of economic growth so as to both eradicate poverty and improve people's livelihoods
- Consolidating peace, stability and unity
- Good governance
- A well educated and knowledgeable society
- Building a competitive economy which is capable of producing sustainable growth and shared benefits.



To be able to achieve all the Vision 2025 goals, the Ministry of Finance amongst other things is doing the following:

- Ensuring that macroeconomic stability prevails in the country through its monetary, fiscal and exchange rate policies
- Providing a public financial management system
- Providing national policy analysis during the formulation of various national policies
- Managing and maintaining national data through the National Bureau of Statistics
- Coordinating policies for attracting investors, including the promotion of Public-Private Partnerships (PPP's).

## AREAS OF OPPORTUNITY FOR PARTNERSHIP

Tanzania has experienced a strong economic performance over the past ten years. This is despite the ramifications of various shocks, including hiked oil and food prices and the global economic and financial crisis. This performance was spurred on by sustained structural reforms, coupled with prudent fiscal and monetary policies; geared towards achieving broad-based growth and poverty reduction objectives. Growth averaged 7 per cent between 2001 and 2010, and recorded 6.8 per cent in 2012; with potential to grow between 8 and 10 per cent in the few years to come. With a view to ensure this happens the country has identified infrastructure development as key, focusing on ports, airports, roads, rail and energy. The policy and regulatory frameworks are in place to support PPPs and BOT arrangements.

Tanzania is blessed with various natural resources which make it favoured as a destination for foreign investment. Apart from its wide range of arable land, the county has various minerals including gold, diamond, tanzanite and coal, to mention just a few. A large part of its natural resources are yet to be developed, thus providing opportunities for partnerships, such as:

- Long beaches and wide range of wildlife for hotels and recreational facilities
- Transport Sector: Tanzania is positioned to be a distribution hub and trade gateway to Asia and Europe. There are potential partnerships in infrastructure development and logistical arrangements
- Recent discovery of natural gas provides another opportunity for partnership in power generation
- Tanzania is surrounded by three big lakes (Victoria, Tanganyika and Nyasa) and numerous permanent rivers which make it possible for irrigation farming
- The existence of various minerals is another opportunity for extracting and processing industries, so as to create value additions to minerals
- The recent discovery of natural gas, to the tune of over 40TCF, will go along away to reducing the cost of power generation and that of doing business.

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# CREATING A BUSINESS ENVIRONMENT CONDUCIVE FOR INVESTMENT



**Omari Issa** Chief Executive Officer of the **Investment Climate Facility for Africa** (ICF) describes how the organisation assists African governments and the private sector in improving the framework for investors.

Attracting private sector investments is easier when there is a conducive business environment in which to operate. Investors find clear and transparent systems for registering and licensing businesses, paying taxes and clearing goods through customs, all help to inspire confidence. The private sector also needs a fair, transparent and speedy system for resolving any commercial disputes that may arise.

The Investment Climate Facility for Africa (ICF) has been working closely with African governments and the private sector to improve areas that drive the investment climate.

## GOVERNMENTS WORKING TOWARDS JUSTICE

For many African countries, improving the commercial justice

system has been top priority. ICF has worked with the governments of Burkina Faso, Mali, Mauritius, Nigeria, Rwanda, Sierra Leone, Tanzania, Togo and Zambia on projects that aim to speed up the resolution of commercial disputes.

For example, a project with the government of Zambia has modernised 13 courts with real-time digital recording, enabling judges and lawyers to have transcripts and audio backups of the court proceedings within the same day. It has also introduced a case and record management system that has enabled digitalisation of over 10,000 court records, eliminating instances of loss and misplacement.

ICF provided support to the government of Mali to establish

an alternative dispute resolution centre that has reduced the time it takes to enforce a contract from 515 days to a mere 30 days. In Sierra Leone, the establishment of a fast-track commercial court has reduced the time from filing a commercial case to judgement from six years to two months.

## AUTOMATING AND STREAMLINING STANDARD PRACTICES

ICF has also worked with the governments of Burkina Faso, Rwanda and Sierra Leone to automate land registration processes. The new systems are facilitating access to credit and helping prevent land disputes, resulting in increasing investors' confidence. In Burkina Faso the automation and streamlining of procedures has made it much easier

to transfer property and the process now takes only 21 days instead of the previous 182 days.

In the area of business licensing and registration, ICF has worked with the governments of Burkina Faso, Cape Verde, Liberia, Mauritius, Mozambique, Rwanda and Sierra Leone to improve their processes. The focus in these projects has been to streamline procedures and reduce costs associated with registering and licensing a business. As a result, businesses in these countries are beginning to reap the benefits.

For example, the establishment of one-stop-shops for business life-cycle services in Cape Verde means that businesses can register in only one hour. They can now formally close a business in 2-10 days and process a construction license in 10 instead of the previous 30 days. In Rwanda, businesses can register in two days instead of the previous 16, they go through only two procedures to register instead of the previous nine, and the cost of registration has gone down from US\$433 to US\$25. If they register online, they do not have to pay a registration fee. In Liberia, the establishment of a single point for business registration has reduced the time to register a business from 99 days to only six days.

### CUSTOMS AND TAXES ARE GETTING EASIER TOO

When it comes to taxation and customs administration, ICF has worked with the governments of Burkina Faso, Ethiopia, Lesotho, Liberia, Mozambique, Rwanda, Senegal, Tanzania and Zambia to establish efficient tax and/or customs administration systems. Streamlined processes are helping to encourage greater compliance and reducing transaction costs for businesses.

For example, in Rwanda, domestic taxes can now be filed through

an e-filing system and payment can be made in person, online or using mobile money transfer. This has drastically reduced the time it takes to pay taxes, which used to take up to 23 days in the past. In Senegal, customs administration has been modernised and now it takes 15 minutes instead of two days to register for customs declarations and only one day to clear goods through customs instead of the previous 18 days. A paperless trade process has been established which means that businesses can get customs pre-clearance in seven hours instead of two days.

Streamlined processes are helping to encourage greater compliance and reducing transaction costs for businesses.

In the area of infrastructure facilitation, ICF is providing support to projects in Rwanda, Sierra Leone and Tanzania. In Rwanda, support has gone towards helping the government increase its human resource capacity in the energy sector. In Sierra Leone, support is going towards establishing a safe and reliable transfer service between Freetown and the international airport in Lungi. In Tanzania, effort is being made to improve security and the speed of movement of goods along the highway from Dar es Salaam to Rusumo on the Tanzanian border with Rwanda.

### BENEFITS FOR EVERYBODY

The improvements in the business environment in Africa

are benefiting foreign and large investors and especially the small and medium enterprises (SMEs). The growth of SMEs will lead to growth in the economies of the respective countries that in turn will lead to job creation.

**Omari Issa** serves as the Chief Executive Officer of the Investment Climate Facility for Africa (ICF). Mr. Issa has extensive business experience in the public and private sectors, having worked both abroad and in Africa. He has firsthand experience of the realities of doing business in Africa, having previously worked as Executive Director and Chief Operating Officer of Celtel International. Prior to working at Celtel, Mr. Issa spent 14 years with the International Finance Corporation (IFC) and six years with the World Bank. In July 2012, he joined the International Advisory Council of China Investment Corporation.

**The Investment Climate Facility for Africa (ICF)** is an international development institution whose purpose is to enhance the economic prospects of African society by working with businesses and governments to identify and improve priority areas that drive the investment climate. Based in Africa, ICF is a unique partnership between governments, private companies and development partners.

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# COURTEVILLE BUSINESS SOLUTIONS PLC



COURTEVILLE BUSINESS SOLUTIONS

**Courteville** is the preferred partner for governments, government agencies and companies seeking business process re-engineering, empirical statistical information and market penetration.

Courteville Business Solutions PLC was incorporated in 2004, as Courteville Investment Ltd and is now listed on the Nigerian Stock Exchange. Courteville is an ISO 9001:2008 certified e-business solutions development company. The company is focused on process re-engineering in both the private and public sector by providing cutting edge solutions to complex operational challenges, through the development and delivery of unique business solution models, revenue stream improvements and cost management processes.

“The company is focused on process re-engineering in both the private and public sector.”

Courteville is well known in west Africa as a trusted company with a reputation for adopting

fresh thinking in providing and delivering definitive and innovative e-business solutions in their unmatched areas of expertise, ranging from the design and development of customised software and mobile applications, through data capture services, retail business channel delivery services and dedicated cloud hosting services as well as tax administration consultancy services.

## COURTEVILLE HAS PROVEN SOLUTIONS

Courteville is the patent owner of the AutoReg™ Motor Vehicle Administration Documentation (AutoReg™ MVAD) business solution, through which it has created the largest data capture and process platform in sub-Saharan Africa, comprising over 10,000 operators in about 5,000 outlets in Nigeria and Sierra Leone. Over the years, the company has honed its expertise and knowledge in the development of IT solutions that effectively solve endemic and peculiar challenges that are unique to the Nigerian environment and by extension most developing countries in general. These challenges include:

“Courteville is well known in west Africa as a trusted company with a reputation for adopting fresh thinking.”

- Counterfeiting
- Revenue leakages
- Touting
- Unreliable databases
- Service accessibility and delivery time

The solutions, which are all web-based and extremely cost effective to deploy are currently operational in Nigeria and the Republic of Sierra Leone and include:

- AutoReg™ MVAD: flagship and highly successful service
- AutoInsure 3rd Party motor insurance retail platform
- AutoReg Inspector™ mobile phone based remote verification application
- AutoReg™ Enumerator mobile phone based remote

- data capture application
- Parent to School Education Administration & Monitoring System (P-SEAMS)
- Courteville Regulated Product Administration & Monitoring Solution
- Centralised Insurance Policies Database Solution

### IMPROVING MDG PROGRAMMES EXECUTION

The company's expertise in developing solutions for process re-engineering, data capture services and tax administration, places it in a strategic position of significant relevance to governments seeking for empirical statistical information and the effective execution of Millennium Development Goal (MDG) programmes in Nigeria, Africa and other developing countries.

“The company has honed its expertise and knowledge in the development of IT solutions that effectively solve endemic and peculiar challenges.”

In recent times, significant reservations have been expressed by watchers of the activities of aid agencies and European governments on the delivery of projects under the MDGs in Africa. This is coupled with the obvious fact that many aid agencies consistently miss, by as much as 90 per cent their home governments' MDG targets, a

situation that is not unconnected with the myriad of challenges inherently associated with the African environment. These challenges include:

- Difficulties associated with working through host governments' ministries, departments and agencies.
- Inability to identify credible partner organisations in the execution of MDG projects.
- Insufficient or a sheer dearth of statistical data for effective planning, resulting in expensive and time-consuming researches and surveys.
- Inability to effectively reach the target end-user population that urgently requires the services to be provided by the proposed MDG projects.

Courteville's platform provides the most robust opportunity for governments and aid agencies to access effective solutions that would assist them in overcoming these challenges, delivering on the MDGs and achieving the objectives of donor governments.

### ROBUST RELIABLE COST-EFFECTIVE SOLUTIONS

These practical solutions, as highlighted above, are extremely cost effective to deploy and together with one of the largest, most robust, authentic and reliable consumer databases in west Africa, Courteville has access to strategic information for reaching retail businesses, households and consumers.

In addition, Courteville also offers robust solutions for foreign businesses and organisations seeking local business process re-engineering solutions, market entry empirical statistical information and effective

and efficient retail business distribution channels in Nigeria and west Africa.

“Courteville also offers robust solutions for foreign businesses and organisations seeking local business process re-engineering solutions, market entry empirical statistical information and effective and efficient retail business distribution channels.”



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# FINANCING URBAN INFRASTRUCTURE: CHALLENGES AND OPTIONS



**Alberto Gianoli and Aloysius Bongwa**, of the **Institute for Housing and Urban Development Studies** outline some of the challenges facing urban infrastructure and some of the options for improvement in the future.

In 2009, Africa's total population for the first time exceeded one billion, of which almost 40 per cent lived in urban areas. According to projections, the continent will reach the two billion mark around 2050, with 60 per cent of the population living in cities. Between 2010 and 2050, the urban population will, according to UN Habitat's *the State of African Cities 2010*, triple to some 1.23 billion. As figure 1 illustrates, the same dynamics apply when considering African Commonwealth countries.

There is widespread consensus that urbanisation has the potential, if properly managed and steered, to be associated with rising incomes, improved living standards, and human development. However, the demographic expansion

taking place in African cities will continue to create significant challenges in relation to water demand and supply, transportation, waste collection and disposal, energy and water, and air and soil pollution. In other words, the rapid pace of urbanisation requires a major increase in infrastructure spending over the next decades in order to allow African cities to meet crucial development and environmental targets. The problem is that existing local revenue and finance generating structures fall short of the capital expenditures needed to provide the necessary level of infrastructure.

## **BANKABILITY AND AFFORDABILITY**

Urban infrastructure investment comprises of three main

Existing local revenue and finance generating structures fall short of the capital expenditures needed to provide the necessary level of infrastructure.

categories: new developments with land being converted for new urban uses, large investment projects in the transportation sector, and basic urban services. Features typical of infrastructure projects raise the overall risk of investments. Compared with

<b>African Commonwealth Countries</b>	<b>2010</b>	<b>2030</b>	<b>2050</b>	<b>% Growth 2010-2030</b>	<b>% Growth 2030-2050</b>
Total population	439,335,000	696,315,000	1,035,510,000	58.4	48.7
Urban population	178,869,000	345,459,000	617,009,000	93.1	78.6
Urban % of total	40.7	49.6	59.5		

Figure 1. Urban population growth of Commonwealth countries between 2010 and 2050. (Authors' calculations based on World Urbanisation Prospects, 2011 Revision, United Nations, 2012)

projects in other sectors, those in infrastructure usually have longer payback periods and are more susceptible to political and regulatory influence. Infrastructure investment projects in African cities and those belonging to Commonwealth countries are no exception, showing higher than average risk profiles. Furthermore, there are few benchmark projects that can be used to assess how to price these risks. Obviously, the risks associated with the delivery and operation of infrastructure projects negatively affects the cost of finance, a key element of the overall cost of implementing infrastructure projects.

The low levels of private sector involvement in infrastructure in African cities is indicative of the greater risks, both perceived and real, as well as the underdeveloped nature of local capital markets. The cost of finance also affects the issue of affordability, which arises when the costs of developing the infrastructure exceeds the capacity of end users or taxpayers to pay. According to recent research from the *Economic and Financial Studies Division of the European Investment Bank*, obtaining full cost recovery in sub-Saharan African countries would demand the average citizen to spend 25-35 per cent of their income as their share of total infrastructure costs, whereas 15

per cent is usually considered as the acceptable ceiling with the difference having to be subsidised. When cost recovery constitutes too high a share of available income, the commercial risks associated with an investment decision increase substantially, thereby affecting the overall bankability of the infrastructure project.

“Risks associated with the delivery and operation of infrastructure projects negatively affects the cost of finance.”

#### EXISTING FINANCE FOR URBAN INFRASTRUCTURE

Local governments in African Commonwealth countries can finance infrastructure projects in two main ways, borrowing and their own financial resources (e.g. intergovernmental transfers, property taxes and revenue generating facilities), and public-private partnerships. In African Commonwealth countries financing systems are often built around property taxes and transfer

schemes. For example, South Africa and Zambia mainly rely on local taxation and utilities taxes whereas central government transfers provide a crucial share of local government finances in Ghana, Kenya and Uganda. However, it is reasonable to argue that in general resources have not increased in proportion with local authorities' infrastructure investment needs.

In relation to borrowing, only a limited number of local governments have issued bonds, among them Johannesburg, Lagos and Douala. Direct bond issuance is likely to remain a limited option in the near future due to legislative constraints as well as the low borrowing capacity and lack of creditworthiness that characterises the vast majority of cities.

Public-private partnerships have delivered below expectation, mainly due to the fact that the urban services that are commercially viable are limited. Where the private sector cannot recover the cost of infrastructure projects through user charges alone, as in the water sector, public financing remains a necessary condition for the viability of investment. In addition, following the 2008 financial crisis, the level of public-private partnerships in



Cities in African sub-Saharan countries need infrastructure investments to grow

sectors related to urban areas such as water, sanitation and transportation has declined drastically, according to the World Bank's Public-Private Infrastructure Advisory Facility.

### OPTIONS FOR THE FUTURE

There is a clear need for a radical change of scale in the financing volumes for infrastructure across cities in African countries. The difficulty lies in the fact that the preconditions for this to happen are not in place and the search for new systemic and institutional solutions should now become a priority. The financing of the ongoing urbanisation process has to rely on a radical reform of the existing financing paradigms and

practices. Four crucial areas where intervention is urgently needed are outlined below.

#### 1. Decentralisation processes and endogenous financing

Decentralisation not only entails transferring responsibilities from national to local level, but also empowering local governments to generate their own resources to finance investments in infrastructure. Global trends show the inevitability of this process with cities increasingly being considered as engines of economic and social growth. The importance of endogenous sources cannot be underestimated. However, for this to happen local governments have firstly to tap

into a variety of local investment sources such as household savings, remittances, pensions and investment funds, and secondly to optimise tax revenues, particularly those based on property. Changes related to governance and accountability to investors and to transparency in the operations of the public sector would be essential in this respect.

#### 2. Local financial markets

African Commonwealth countries are all characterised by the relative weakness of their financial markets, with the possible exception of South Africa that has domestic banks and a local capital market capable of providing local currency financing. This, according

to the World Bank's Public-Private Infrastructure Advisory Facility, has contributed to a limited capacity to finance infrastructure projects and has required substantial credit enhancement to attract local currency debt. These limitations have to be addressed and some recent developments are proving promising, such as the growth of pension and mutual funds in Botswana, Kenya, Malawi, Mauritius and Namibia. In recent years, the necessary legal and regulatory steps to support these financial institutions have also been taken in Kenya, Nigeria, Tanzania and Zambia.

“The search for new systemic and institutional solutions should now become a priority.”

### 3. Land-based financing mechanisms

Land-based financing mechanisms have a high potential for revenue generation, and can be particularly useful within contexts characterised by high-urban growth where the volume of required investment far exceeds the capacity of traditional public financing models. Land sales and other mechanisms for capturing land value increases through betterment levies, impact fees and developer exactions, can all be part of a general strategy to finance infrastructure investments. Cities in African Commonwealth countries have made very limited use of these opportunities thereby leaving open the possibility of a substantial increase in the use of land-based financing mechanisms in the future.

“Unlock important investment opportunities in infrastructure projects by involving the private sector and other public institutions.”

### 4. Development Bank for Infrastructure

A newly established Development Bank for Infrastructure (DBI) could provide a new channel for borrowing through which the governments of developing countries could finance economically productive infrastructure investments. The DBI could address at least some of the weaknesses of the existing financing environment and help catalyse the needed private sector investment. By providing the type of capital that is in short supply or the guarantees to crowd-in that type of capital, the DBI would enable other types of finance to flow. This institution could serve as a key vehicle to offer risk mitigation, finance crucial bottlenecks, and generate knowledge and experience through scale. It could unlock important investment opportunities in infrastructure projects by involving the private sector and other public institutions such as development banks and sovereign wealth funds.

### CONCLUDING REMARKS

Against the background of the urbanisation process, African Commonwealth countries should address the vast existing infrastructure gap. Relying only on

current financing options will not suffice and innovative financing mechanisms will have to come into play. For this to happen, a substantial rethink of the current institutional arrangements and a review of existing regulations and legislative instruments are required. A concerted effort is needed from all the parties concerned including central and local governments, the private sector and local and international financial institutions.

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The **Institute for Housing and Urban Development Studies**, based at Erasmus University Rotterdam, the Netherlands, is a centre of excellence offering consulting and advisory services, research and training and education in the field of urban management and development.

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# Powering Africa's energy needs

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# AFRICA'S POWER CRISIS



**Professor Anton Eberhard** at the **Graduate School of Business**, University of Cape Town, discusses some of the contributing factors that have led to the underpowered Africa of today.

Sub-Saharan Africa (SSA) is in the midst of a power crisis characterised by inadequate, unreliable and costly electricity infrastructure. Household connections to the power grid are lower than in any other region. The weakness of the power sector has constrained economic growth and development in the region.

The combined power generation capacity of the 48 countries of SSA is about 80 gigawatts (GW); a single country, Spain, has more. The installed capacity per capita in SSA (excluding South Africa) is a little more than a third of south Asia's (the two regions were equal in 1980) and about a tenth of that of Latin America. Capacity growth has been largely stagnant during the last three decades, with growth rates of barely half those found in

other developing regions. This has widened the gap between SSA and the rest of the developing world, even compared to other country groups in the same income bracket.

Less than three in every ten people living in SSA have access to electricity, compared to more than half in south Asia and 90 per cent in east Asia. Progress in extending new connections has also been slow. Following current trends, fewer than four out of every ten African countries will achieve universal access to electricity by 2050.

Per capita consumption of electricity averages just 40 kilowatt hours (KWh) per month in the region, and only 10 KWh if South Africa is excluded. By contrast, the average per capita consumption is 100 KWh per month in the

developing world and close to 1000 KWh per month in high-income countries. If South Africa is excluded, SSA is the only world region in which per capita consumption of electricity is falling. Not only is total electricity generation and consumption in Africa very small, it is also unequally distributed between countries. South Africa's power infrastructure stands in stark contrast to that of the region as a whole. With a population of 50 million people, South Africa has a total generating capacity of about 44 GW (880W per person), accounting for about 60 per cent of the region's electricity consumption. Nigeria, with a population of close to 170 million, is the region's second largest generator, with an effective utility operating capacity of about 5 GW (29W per person).



## POWER IN CRISIS

Power supply in SSA is notoriously unreliable. About 15 per cent of installed capacity is not operational, mainly as a result of ageing plants and lack of maintenance. Power outages are frequent. For these reasons, own generation constitutes a significant proportion of total installed power capacity in the region. In the Democratic Republic of Congo, Equatorial Guinea and Mauritania, backup generators account for half of total installed capacity, and for west Africa as a whole, 17 per cent.

The increasing use of grid-connected temporary emergency power in the region reflects the gravity of the power crisis. Countries experiencing pressing power shortages can enter into short-term leases with specialised operators who install new capacity typically in shipping containers within a few weeks. Emergency, temporary generators now account for an estimated 750 megawatt (MW) of capacity in SSA, and they constitute a significant proportion

of total capacity in some countries. Emergency power is relatively expensive, typically around US\$0.20–0.30 per KWh. In some countries, the cost of emergency power is a considerable percentage of GDP.

“SSA has generally lagged behind other regions of the world in terms of infrastructure and power sector investment and performance.”

External factors have exacerbated the crisis in many countries. Drought has seriously reduced the power available to hydro-

dependent countries in western and eastern Africa. Countries with significant hydropower installations in affected catchments, Burundi, Ghana, Kenya, Madagascar, Rwanda, Tanzania and Uganda, have had to switch to expensive diesel power. High international oil prices have put enormous pressure on all of the oil-importing countries of SSA, especially those dependent on diesel and heavy fuel oil for their power generation needs. War has seriously damaged power infrastructure in Sierra Leone, Liberia, the Central African Republic, Somalia, and the Democratic Republic of Congo. In Zimbabwe, political conflict and economic contraction have undermined the power system as investment resources have dried up.

In summary, SSA suffers from chronic power problems, including insufficient investment in generation capacity and networks, slow progress in connectivity, poor reliability, high costs and prices that do not cover costs (constraining



“The funding gap is so significant it requires the ideological debate of public versus private finance to be set aside.”

maintenance, refurbishment and system expansion). Drought, conflict and high oil prices have exacerbated the crisis. The overall deficiency of the power sector has constrained economic and social development. While the extent of the problems and challenges differ across regions and countries, SSA has generally lagged behind other regions of the world in terms of infrastructure and power sector investment and performance.

#### THE FUNDING CHALLENGE

To address these deficiencies and to accelerate energy infrastructure development in Africa, the Programme for Infrastructure Development in Africa (PIDA) has been jointly developed by the African Union, the NEPAD Agency and the African Development Bank (AfDB).

PIDA assumes that the average economic growth rate for African countries will be 6 per cent a year between 2010 and 2040, driven by a surging population, increasing levels of education and technology absorption. This growth implies that, over the 30 years to 2040, the GDP of African countries will multiply six fold, and the average per capita income will rise above US\$10,000 for all countries.

Power demand is envisaged to increase from 590 terawatt hours (TWh) in 2010, to more than 3,100 TWh in 2040. To keep pace, installed

power generation capacity must rise to almost 700 GW in 2040.

PIDA has drawn up a Priority Action Plan (PAP) that details the immediate way forward by presenting actionable projects and programmes that promote sound regional integration between 2012 and 2020. The priority project list is the result not only of analytical work but also of a thorough extensive consultation process with the Regional Economic Communities (RECs), the power pools, specialised agencies, sector ministers and other relevant development stakeholders. Projects were prioritised based on three criteria categories:

1. Eligibility and regional integration
2. Feasibility and readiness
3. Development impacts.

“African countries and economies are growing and their interactions with the world are changing. For many Africa countries, China is now their largest trading partner”

These detailed criteria were discussed and agreed as part of the extensive PIDA consultation process with stakeholders.

Projects selected for the PAP have been assessed, selected and ranked based on sub-criteria within each of these three groupings and were validated during the regional

consultations, review processes and endorsement from sector ministerial meetings.

According to the African Union Commission in 2012, the overall capital cost of delivering the energy component of the PAP from 2012 through to 2020 is expected to be around US\$40 billion.

#### THE FUNDING GAP & REQUIRED REFORMS

But the PAP represents just a fraction of total power sector investment needs. The funding gap is so significant it requires the ideological debate of public versus private finance to be set aside and for all the mechanisms and resources to reduce the gap to be mobilised.

There are six areas that require focus. All must be aggressively pursued. Firstly, current underpricing must be corrected and subsidies more effectively targeted. Secondly, new electrification strategies need to be more nimble and smarter, learning from the rapid increase achieved in communications infrastructure over the last two decades. Thirdly, inefficiencies within the current delivery mechanisms, dominated by state-owned utilities need to be substantially reduced through governance reforms. Fourthly, sector reforms must be deepened to allow for greater private sector participation within a clear regulatory environment, contributing private equity and debt finance as well as management and technical capacity. Fifthly, new private generation capacity must be encouraged and facilitated through the careful management of hybrid power markets. Lastly, regional integration must be aggressively pursued to reduce overall costs and realise broader economic and political benefits.



Most African countries had bold power sector reform ambitions in the early 1990s. Backed by development assistance from the north, policy documents were produced and new laws enacted, with the aim of unbundling our power sector, privatising and introducing competition. While some countries did unbundle, and while we have seen increasing levels of private sector participation, no African country today fully embodies what was then the standard prescription of power sector reform i.e. a privatised and fully competitive electricity markets. What we have ended up with is a hybrid between the old and the new. Increasingly we see the introduction of private participation in the form of Independent Power Producers (IPPs). But in most cases, the incumbent state-owned utility is still in a dominant market position. And in many cases, national utilities are continuing to build new generation capacity alongside IPPs.

These hybrid power markets present two challenges. The first is the ongoing need for improving the technical and financial performance of state-owned utilities through a range of governance reforms, including performance contracts and mixed capital enterprises, which are necessary to align incentives that encourage better outcomes for the sector.

The second challenge is that of clarifying roles and responsibilities in hybrid power markets so that we accelerate investment in new capacity. These roles and responsibilities include power planning, allocation of new build opportunities between state utilities and IPPs, linking planning to timely initiation of procurement processes, including where appropriate international

competitive bidding and, finally, building effective negotiation and contracting capabilities so that plans are translated into operating power plants with less delays and in time to meet growing demand. Africa's power sector will look very different in the future.

### IN CONCLUSION

African countries and economies are growing and their interactions with the world are changing. For many Africa countries, China is now their largest trading partner, not the traditional links with ex-colonial countries. There is no doubt this shift in economic gravity and orientation will profoundly impact on the way in which we confront and tackle the development and investment challenges in Africa, including those in the power sector.

We have already seen the Chinese unlock projects that had been on the drawing board for decades. There is a new kind of pragmatism in designing and implementing these projects and we are seeing progress. The growing involvement of the east in African projects will also increasingly have an impact on the overall policy environment and power sector reform agenda. The influence and policy prescriptions of the traditional DFIs will be less felt. Instead we shall see a growing pragmatism, a commitment to see what works, to learn, to adjust and to move forward.

Africa's inadequate generation capacity and its equally inadequate and unreliable transmission and distribution networks constrain economic growth and limit the social benefits of electricity use. The investment requirements are massive, but we are seeing progress. Private sector investments are complementing public sector initiatives while new investors are changing the power landscape across the continent.

**Anton Eberhard** is a Professor at the University of Cape Town where he directs the Management Programme in Infrastructure Reform and Regulation at the Graduate School of Business. His research and teaching focuses on the restructuring and regulation of the electricity and water sectors, investment challenges and linkages to sustainable development. He has worked in the energy sector for more than 30 years and was the founding Director of the Energy and Development Research Centre. Prof Eberhard is a Foundation Member of the Academy of Science of South Africa and currently serves on the country's National Planning Commission.

### The Management Programme in Infrastructure Reform & Regulation (MIR)

strives to be a leading centre of excellence and expertise for Africa and other emerging and developing economies. Based at the University of Cape Town's Graduate School of Business, MIR aims at enhancing understanding and building capacity in infrastructure investment, reform and regulation in support of sustainable development. MIR's main focus at present is in the electricity and water sectors, but growth is expected in gas, transport and in telecommunications

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# HELPING AFRICA BENEFIT FROM ENERGY INFRASTRUCTURE



**Makhtar Diop**, the **World Bank's** Vice President for Africa, is passionate about helping the continent enjoy the benefits of reliable energy supply. In this article he outlines the initiatives and support of the World Bank in building more robust energy infrastructure for Africa.

It is a stunning fact that only one in three of the African population has access to electricity. This means that 600 million people and 10 million small and medium-sized businesses in Africa today have no access to power, and nearly 80 per cent of Africa's households rely on wood, charcoal and biomass to cook the family's dinner.

Those African homes and businesses that do have power pay three times as much as their wealthier counterparts in the United States and Europe, despite the fact that Africa is blessed with some of the world's most prolific hydropower, geothermal, wind and solar potential, as well as significant oil and natural gas reserves.

Not only do they pay more for power but Africans routinely

endure regular power outages. Thirty countries on the continent face regular interruptions to their power supply.

This is why too little electricity is one of the biggest challenges standing in the way of Africa achieving steadily higher growth rates, better education for its children and teenagers, good quality health services that work, farms and agribusinesses that can grow enough affordable nutritious food for Africans to eat – just to name some of the transformational priorities which can happen when we turn the lights on across Africa.

## **COMBINED BENEFITS**

I am passionate about lighting up homes, schools, businesses, clinics, libraries and parliaments across the continent. More power for Africans

will allow them to transform their living standards and turn the continent's growth into tangible benefits for all.

One of the most important of these benefits is using Africa's vast hydropower projects to increase food production in some of the driest parts of the world, especially in the Sahel, where many people live with the threat of hunger and malnutrition. By using electricity to irrigate arid and dry lands which are unused, farmers can grow enough cereals and other crops to feed their own families and sell their surplus food to local and regional markets. This in turn allows them to improve their economic livelihoods and reduce poverty in the Sahel and west Africa in particular. More energy therefore contributes significantly



High voltage electricity distribution pylons in the Free State, South Africa

to improving food security and resilience to drought, two aspects of life on the African continent today that are becoming steadily worse with climate change.

As a result, energy security is a key priority for the World Bank in Africa, and we are moving ahead relentlessly to put power infrastructure in place to plug regional communities into cross-border power pools, create more irrigated land to grow food and

generate jobs, galvanise more trade and commerce within the region, and unlock the full development potential of electrical power.

Let me emphasise that Africa does have a power generation problem. It has vast renewable hydropower capacity in Ethiopia, the Democratic Republic of Congo, Guinea, Cameroon, and Zambia (the water towers of Africa) which can produce large-scale power at about one-third or less of the cost

of thermal generation. Clean gas for power can be produced along the coast of east Africa, especially in Tanzania and Mozambique, and also in some countries in West Africa, such as Nigeria and Cote d'Ivoire, and deliver cheaper electricity. The geothermal capacity in the Rift Valley also can be tapped for large-scale clean energy generation.

### **REGIONAL NETWORKS**

So my colleagues and I are relentless in investing in power generation

networks and infrastructure to transmit power across regional groups of countries in western, eastern, central, and southern Africa because moving country-by-country will never deliver energy's transformational promise of more economic growth, significantly less poverty, more jobs, especially for women and young people, and shared prosperity for all Africans.

In other words, without access to modern energy services, African countries will find it very difficult to achieve their Millennium Development Goals by 2015, a date that is just around the corner and getting ever closer.

So over the course of the last 12 months, we have supported the Lom Pangar Hydropower Project on Cameroon's Sanaga River. The World Bank is a key partner to the project, which will increase the country's electricity supply and improve the reliability of power supply for up to five million people. Electricity will be cheaper. The project will mean less frequent power cuts, especially during the dry season, and more productive investments.

We have also helped fund the Regional Eastern Africa Power Integration Program, the first phase of which will connect Ethiopia's electrical grid with Kenya's, creating power sharing between the two countries, reducing energy costs and promoting sustainable and renewable power generation. The project will be transformational for Kenya, a country with enormous potential to reach middle-income status in the next decade. For both countries, it will mean more jobs.

Most recently, we approved the Niger Basin Water Resources Development and Sustainable Ecosystems Management Program. The project will not only generate more electricity, but increase

food production, boost jobs, and create economic opportunities for families and communities in the nine countries that make up Africa's Sahel region. The Kandadji dam will increase the Niger Valley's irrigated crop land from 10,000 to 55,000 hectares.

### ENERGY RAISES THE QUALITY OF LIFE

Together these projects stand to bring more power to millions of people, bettering the lives of mothers, school children, teachers, doctors, shopkeepers and others – people who need electricity to thrive and do more for their families and communities.

For example, in a study from Tanzania, having electricity in a village raised people's business earning by 61 per cent, and non-farm incomes in villages with power were more than 100 times larger than in villages that were not electrified.

For our part, the World Bank Group is profoundly committed to working side-by-side with African countries, their private sector and communities themselves, to help Africa solve its energy shortage. Our Africa energy portfolio now has 53 projects worth US\$9.4 billion on the books (up from \$3.8 billion in 2009), and our future pipeline of new projects is growing. We are working on how new public and private financing for power can make a commanding difference; and ultimately, step up the momentum and commitment towards funding more projects that generate more power for Africa.

Without electricity, Africa's development future cannot prosper. The good news is that much is being done to change this, and that governments are focused on it. Our job at the World Bank is not done until all Africans can turn the lights on at home, at work and nationwide.

**Makhtar Diop** is the World Bank's Vice President for its Africa region. A former Senegalese Economy and Finance Minister, Diop was appointed to his current position in May 2012. He has had extensive experience in banking and finance in the Africa region. From 2009–2012, Mr Diop was the Country Director for Brazil, managing the World Bank's largest country programme. Prior to this appointment, he served variously as Director for Strategy and Operations in the Latin American region; Director for Finance, Private Sector and Infrastructure in the same region; and Country Director for Kenya, Eritrea and Somalia. Before joining the World Bank, he also worked as an economist at the International Monetary Fund in Washington DC.

**The World Bank** is a source of financial and technical assistance to developing countries around the world and has provided support for billions of dollars of investments in infrastructure projects over the last 40 years. The World Bank Group consists of five organisations: the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA), and the International Centre for Settlement of Investment Disputes (ICSID).

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# THE TRANSFORMATION OF THE NIGERIAN GAS SECTOR



Nigeria's vast reserves of untapped gas have, until now, been largely overlooked. This article highlights the country's Gas Master Plan – managed by the **Nigerian National Petroleum Corporation** – to strategically develop the abundant and growing gas sector.

The Nigerian National Petroleum Corporation (NNPC) is the state-owned national oil and gas company of Nigeria. Founded on April 1, 1977, via a merger of the Nigerian National Oil Corporation and the Federal Ministry of Mines and Steel, the NNPC is a vast corporation with 23 divisions and 10 subsidiaries. The NNPC functions in legal cooperation with the Nigerian federal government and a number of foreign multinational corporations, including Chevron, Royal Dutch Shell, Agip and ExxonMobil. The collaboration between these companies and the NNPC forms the method by which the Nigerian government conducts petroleum exploration and production.

Historically, the production and export of oil has dominated Nigeria's oil and gas sector. Oil accounts for over 90 per cent of the national income. With the nation's primary focus so firmly fixed on crude oil production, the abundant gas reserves have, until now, been overlooked. However, since democracy was established in 1999, there has been some movement towards developing the largely untapped gas reserves. Nigeria has huge amount of gas

with some 187 trillion cubic feet (Tcf) of proven reserves and about 600Tcf of unproven gas reserves and 300,600Tcf of unproven gas reserves. Previously overshadowed by oil, the gas sector is due to experience rapid and substantial growth. The NNPC plays a vital role in working with the government to develop the gas policies that are beginning to unfold and open up the market.

## THE NIGERIAN GAS MASTER PLAN

As part of Nigeria's resolve to become a major international player in the international gas market, as well as establishing a solid framework for gas infrastructure expansion within the domestic market, the Nigerian Gas Master Plan (NGMP) was approved on February 13, 2008.

The NGMP is the government's guide for the commercial exploitation and management of Nigeria's gas sector. The strategic intent is to create a material and profitable gas business with a target net operating income (excluding liquefied natural gas dividends) of US\$1 billion by 2020. This target calls for aggressive growth of about 22 per cent annually until the end of the decade. The NNPC will

“Nigeria has a huge amount of gas, with some 187 tcf of proven and 300,600 tcf of unproven gas reserves.”

simultaneously put effort into maximizing the footprint and value from various liquefied natural gas (LNG) businesses.

Central to the reformation of the Nigerian gas sector, the NGMP aims to provide a holistic framework for the development of gas in Nigeria. There are three key strategies laid out in the plan:

1. Stimulate the multiplier effect of gas in the domestic economy
2. Position Nigeria competitively in high value export markets
3. Guarantee the long-term energy security of Nigeria

## PROGRESS

The NGMP is registering real progress and over the last year the NNPC revamped the commercial



framework for natural gas in the domestic market. Gas prices have been reviewed from past sub-commercial levels to a more commercially viable level, with a view to attaining export parity within the next year. In addition, the contracting framework for gas has been revised significantly and key regulatory frameworks such as the Network Code for gas pipeline open access have been developed creating a bankable framework for investors in gas. To facilitate orderly growth in supply, the Domestic Supply obligation regulation was also put in place and a Gas Aggregation Company set up to manage domestic obligation

volumes. To further enhance the bankability of the growing gas sector, the World Bank Partial Risk Guarantee was also formulated and is now being finalised to provide revenue security for gas supplied to government-owned power plants.

#### **PETROLEUM INDUSTRY BILL AND INVESTMENT**

Underpinning the development is the Petroleum Industry Bill (PIB), which covers all gas related legislation. The PIB was devised to cement the entire reform effort and it is hoped that this will be accomplished in the short term. As a direct result of the NGMP the gas sector has met

with keen investor interest. When the Federal Government invited global energy companies to bid as potential core investors in the NGMP, more than 50 energy companies applied and 15 have been short-listed as core investors.

With the efforts towards a credible and competitive gas market, the policy reform looks set to deliver on the aspirations of President Goodluck Jonathan. Current projections of gas supply indicate that by 2018, Nigeria's gas production – in a barrels of oil equivalent – could be as high as 1.5 million barrels per day, making it a significant sector on its own.

# INTERVIEW WITH MR. ANDREW LA'AH YAKUBU



The **Nigerian National Petroleum Corporation's** Group Managing Director speaks to the Commonwealth Business Council about his vision and strategy for developing Nigeria's gas sector.



A highly respected engineer and the Group Managing Director of the Nigerian National Petroleum Corporation (NNPC), Andrew La'ah Yakubu has had a commendable 30-year career serving the oil and gas industry. Working in senior roles for a number of leading organisations, Yakubu has won a great deal of respect from his peers. Yakubu graduated from the Ahmadu Bello University in Zaria. He was an Executive Director in Nigeria's premier indigenous Engineering Company NETCO and later appointed Managing Director of Warri Refining and Petrochemical Company Limited. He also held the position of Group Executive Director in Exploration and Production Directorate.

**Q What are Nigeria's strategic aspirations for its gas industry?**

**A** The plan is to significantly boost the nation's generating capacity in the medium term by leveraging natural gas, and this is progressing steadily. For gas based industrialisation, the plan is to transform Nigeria into a regional hub for fertilizer, petrochemicals and related gas based industries. The combination of gas to power and gas based industrialisation aims to catalyse wider industrialisation and wealth creation domestically. Whilst doing this, Nigeria's footprint in global Liquefied Natural Gas (LNG) trade will be maintained as we strive to provide about 10 per cent of the world's LNG trade. Our export agenda also includes regional pipeline gas supply as part of the New Partnership for Africa's Development (NEPAD) objectives. In essence, we have a clearly articulated agenda for gas as outlined by the President, and we are pursuing this diligently.

**Q What is the current status of the Nigerian gas reform?**

**A** For several years now, the gas industry growth in Nigeria was stunted for a variety of reasons. Poor infrastructure, sub-commercial frameworks, a poor regulatory regime and a preference by the dominant players for investments in oil and

export gas. The consequence of this meant a slow growth of the sector and the prospect of a failed power sector agenda.

Against this backdrop and pursuant to Mr. President's agenda, there was need for a major policy revamp. The Honourable Minister for Petroleum Resources has therefore in the last few years focused strongly on major policy initiatives to transition the Nigerian gas sector into a more vibrant one that can truly support Mr. President's agenda.

A major revamp of gas infrastructure has also begun. A gas infrastructure blueprint was developed and is now being implemented. To date, the expansion of the Escravos to Lagos Pipeline System (ELPS) has commenced and is 60 per cent complete, the vital east/west pipeline link has also commenced and through the course of this year, the south/north pipeline will begin. This aggressive infrastructure agenda aims to widen access to both supply and markets.

Finally as part of the reform programme, gas industrial hubs are being facilitated to galvanise the gas-based industrialisation agenda. The first of such is the Ogidigbe Industrial park which is being positioned to be the biggest gas

industrial park in Africa housing a 2.6 million tonnes per annum (MTPA) fertilizer plant and a 1.3 MTPA petrochemical plant.

Underpinning the aforementioned is the ultimate effort in the Petroleum Industry Bill, which puts together all gas related legislation in a dedicated manner. This will cement the entire reform effort and it is hoped that this will be accomplished in the short term.

**Q What is the present situation for the gas to power sector?**

**A** As indicated earlier, gas to power is a cardinal short-term focus for the gas effort. Consequently, a lot of the early policy interventions of the Honourable Minister aimed to catalyse rapid response to the growing power sector demand. Gas to power has grown significantly and at the moment, about 70 per cent of total supply goes to power estimated at about one billion cubic feet per day (bcf/d). Over the last six months, about 300 million cubic feet per day (mmcf/d) of gas was added to the grid from the emergency initiative of the Honourable Minister to boost supply to power. Further additions of about 200mmcf/d are expected in the next three to six months. The impact of the gas additions to power has been noticeable with power generation attaining an all time peak of about 4.5 gigawatts (GW) recently. As the market reforms get entrenched and many other small marginal players come on stream, it is anticipated that a further boost in supply will be developed.

**Q What is the Gas Based Industrialization agenda?**

**A** The Gas Based Industrialization agenda is specific to catalysing the

massive industrialisation of Nigeria. Through effective linkages to the agricultural sector, by enhancing domestic fertilizer production, the gas sector will galvanise numerous food processing industries that will be geographically dispersed creating widespread employment. Similarly, with petrochemical plants, numerous secondary manufacturing industries can develop, creating the foundation for industrialisation. Realising this was the basis for His Excellency, Mr. President, launching the Gas Revolution Initiative in 2011. Steady progress is being made in this regard.

**Q How is the issue of gas flares being handled?**

**A** Gas flares have been a stigma of the Nigerian gas sector. However, holistic steps are being taken to reduce this significantly. The domestic supply obligation programme comprises many gas flare projects. Specifically, by 2015, over 600mmcf/d of currently flared gas is expected to be utilised. This will be due to the aggressive growth in gas infrastructure, which is enabling access to many flare locations. Complimenting this effort is the regulatory role of the Department of Petroleum Resources (DPR), which prevents any new development from progressing without a clearly articulated gas utilisation programme. In essence, new flares are not being allowed and the old flares are being taken out for domestic use.

**Q What plans are there regarding the export of LNG?**

**A** Good progress is being made in the export of LNG. Nigeria LNG Limited continues to be a flagship company with six active trains and a total installed capacity of about 26 MTPA. We are targeting a flame ionization detector Final Investment Decision (FID) in

2013. Gas supply agreements are being finalised and a funding scheme agreed. With this project we will add about 10 MTPA by 2017. Other projects are also being evaluated too. We have formally commenced gas supply through the 600km West African Gas Pipeline to the west African sub-region, supplying between 70-100 mmcf/d of gas mostly to Ghana. This is expected to increase through the coming years. Work is also progressing on the Trans-Nigeria gas pipeline, which will eventually evolve into Trans-Sahara gas pipeline supplying gas to neighbouring countries in north Africa.

**Q What are the investment opportunities in the Nigerian gas sector?**

**A** The activities above translate into huge investment opportunities in the sector. Opportunities exist in upstream supply development, field support services, gas pipeline fabrication and construction, gas processing plants – development and operations, downstream gas utilisation projects and more. It is anticipated that the gas industrialisation agenda alone will require over US\$15 billion in investment, creating untold opportunities and an average of about US\$1 billion annually for upstream.

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# AFRICA'S EXPANDING ENERGY LANDSCAPE



**Alex Vines of Chatham House** welcomes the expansion of oil and gas resources in east Africa, and calls on the region's political leadership to show vision and foresight by making strategic use of these resources to enhance regional infrastructure, diversify economies further and invest in education.

Five years ago, books on African oil hardly mentioned east Africa. The region was also treated at international oil and gas conferences as the graveyard slot. No longer: today east Africa is the new oil and gas frontier, and Mozambique is the hot prospect with Tanzania not far behind. East Africa shows how quickly oil and gas frontiers shift and how new finds swiftly change the way that industry investors and analysts treat a region. The back story of African oil and gas is already impressive. During the last 20 years, figures for known oil reserves in Africa have risen by more than 25 per cent, and gas reserves are now known to be more than 150 per cent higher.

This is a story of how little has been explored, and how much is still

to be found. East Africa is finally on the oil and gas map; compared with some 15,000 wells drilled in west Africa, only 500 have been drilled to date in east Africa. Talk of peak oil is dead, partly due to new discoveries. South American pre-salt discoveries in Brazil have been all the rage, but the prospect that this geology continues across to the Gulf of Guinea is significant. Angola – far from peaking in 2012 – could extend its life as a major oil exporter by an additional 30 years, and could eclipse Nigeria. We need to constantly review our assumptions.

## **AFRICA'S CHANGING MARKETS FOR OIL EXPORTS**

Changing markets have also impacted on Africa's fortunes. Since the end of the Cold War, the US, China and others have

During the last 20 years, figures for known oil reserves in Africa have risen by more than 25 per cent, and gas reserves are now known to be more than 150 per cent higher.

seen African oil as part of an effort to diversify away from too high a dependence on Middle East oil. However, over the last decade the growing demand from

Asia, especially India and China, has also impacted how African governments look at oil and gas export markets. The figures speak for themselves: the International Energy Agency projects that China will become the world's largest net importer of oil by 2020, and China already receives an estimated one-third of its oil imports from Africa. Angola is the second largest supplier of imported oil to China after Saudi Arabia, and India imports some 12 per cent of its oil from Nigeria.

### CHANGING ROLES FOR ASIAN NATIONAL OIL COMPANIES

Western international oil companies (IOCs) still dominate Africa's upstream markets, helped by decades of political experience as well as technological advantage, but this will change over the coming decades as African states seek to diversify their relationships and strike better deals. Chinese state oil companies are already buying out western independents, or are being encouraged in Beijing to enter into joint ventures. Examples include a tie-up between BP and Sonangol Sinopec International (SSI) in Block 18 in Angola. US companies, however, seem more circumspect about entering such partnerships. There are signs too that Sinopec, the China National Offshore Oil Corporation (CNOOC) and others are looking to international best practice to enhance their production prospects. Like western IOCs, they are under pressure to procure more oil. Joint ventures such as in Angola are not regarded in Beijing as a sustainable long-term strategy, although they are sometimes seen as necessary for market entry. In the case of Angola, Sinopec and CNOOC would have preferred to stop working through a Hong Kong-listed joint venture vehicle. In Angola, China has

failed to win significant oil block concessions, but instead has locked in oil supplies through oil-for-infrastructure deals supported by billions of dollars of loans – coined as 'Angola mode' by the World Bank. In 2011, almost 250,000 work visas were issued by Angola for Chinese visitors, the majority for construction workers on these official projects.

### AFRICA'S CHANGING ENERGY GEOGRAPHY

Yet beyond the politics, there are major shifts which are changing the geography of African oil. The emergence of shale gas and oil is a game changer. The USA had been expected to be a significant liquefied natural gas (LNG) importer but today, Qatar, Norway, Russia and west Africa can no longer assume that they have a US market. In addition Europe, China and Australia may become major shale gas producers, and this could transform the international market for LNG. Angola, Equatorial Guinea and Nigeria among others need to rethink their gas plans as the market they planned for five years ago has gone.

They cannot look east either. The massive gas finds along the east African coast, especially off Mozambique, but also in Tanzania's waters, make east Africa one of the world's most active oil and gas exploration areas. Reports suggest there are 250 trillion cubic feet of prospective resources in these three countries. International companies such as BG Group, Anadarko Petroleum Corporation, Tullow Oil, Eni S.p.A and Afren have all had commercially viable finds. The gas story from Mozambique is an 'astonishing exploration success story', and Tanzania is 'impressive', according to Wood Mackenzie, the mining and energy consultancy. The east African discoveries could support up to sixteen LNG trains,

but only two train developments have so far been proposed.

The finds in Tanzania and Mozambique are significant but market economics will decide their future. Massive infrastructure investment will be required and billions of dollars of project finance will need to be raised on the international markets to fund it. The hard reality is the breakeven price for development of these new projects. Currently however, predicting the price is almost impossible, as it depends on projections for the international market price – which includes shale gas developments in China, North America and Australia. This price uncertainty may add significant delays to developing these finds, at a time when domestic expectations of a gas windfall are rising. Mozambican officials speak of first gas to market in 2018, but this looks grossly over-optimistic, as Maputo has not even yet developed a gas master plan.

East Africa's recent gas finds have been followed by oil discoveries in Kenya in 2012. South Sudan and more recently Uganda have also experienced oil finds. Earlier in the year, Kenya's President Mwai Kibaki interrupted a scheduled speech to announce a significant find by Tullow Oil in the country's north-western Turkana region. His relief was palpable as he called it a 'major breakthrough'. However, analysts are already warning of the 'resource curse' in east Africa and are drawing lessons from oil producers elsewhere in Africa. Ghana probably provides the best example, as its economy and political class are coping with recent oil discoveries. Shallow economies such as Chad and Equatorial Guinea, or states with a long history of oil distortion, such as Gabon, Angola and Nigeria, are less helpful.



East Africa poses unique challenges. Kenya has a strong agribusiness base, exporting tea, coffee, flowers and vegetables. It enjoys a major tourism industry and Nairobi is a regional hub, providing financial and other services. If oil reserves prove to be significant, this could be transformative for Kenya's economy. It could also embolden Kenya's ambitions to become a leading regional power. This mood was summed up by a columnist in Kenya's *Business Daily* who wrote, 'Kenya's economic and diplomatic clout had largely suffered from a lack of known natural resources that are of strategic importance to the rest of the world.' Kenya's politicians will need to keep a close eye on this bullishness, as regional cooperation within the East African Community (EAC) rather than head-on competition makes better economic sense.

Kenya has already begun to position itself to develop facilities for exports of oil from the region – specifically from Uganda and South Sudan. Work started in early March 2012 on building a huge deep-water port in Lamu, intended to service a pipeline across northern Kenya as part of the Lamu Port–South Sudan–Ethiopia Transport

Corridor (LAPSSET). LAPSSET aims to foster transport and trade links between Kenya, South Sudan and Ethiopia. The project includes the construction of an oil refinery at Lamu, oil pipelines, railway lines and a highway linking Lamu to Isiolo in Kenya, Isiolo to South Sudan, and Isiolo to Ethiopia. Finding the US\$23 billion funding for such a massive infrastructure project is proving to be challenging.

The Chinese government has also signalled that it prefers for South Sudan to use the current oil pipeline to Port Sudan for South Sudanese oil exports. China played a critical role in getting both Sudan and South Sudan to reach an agreement over resuming exports of South Sudanese oil through Sudanese territory.

### **PROSPECTS FOR THE REGIONAL ECONOMY**

East Africa is changing, and planning for a future regional economy makes sense. Demographics are likely to change the east African landscape over the next fifty years. Uganda and Tanzania are both forecast to overtake Kenya in population size. According to UN projections, Tanzania will become the fifth

largest country in the world (the fourth being the United States). With its growing middle class and successful business community, Kenya should remain as a reliable regional anchor state, although its reputation as a stable democracy was severely undermined by the surge of violence that followed the presidential elections in 2008. The greatest worry is that oil money might further blight an already corrupted political class.

Economic growth in sub-Saharan Africa peaked in 2007 at 7.1 per cent, and it is still expected to average 5.5 per cent between 2009 and 2012. East Africa is no exception and with growing regional markets and population growth, its leaders should not just focus on external markets for their oil and gas plans but also consider how better to integrate these discoveries into their regional economies. There needs to be a link into the local economy that complements the current development process. Growing agricultural development will require petrochemical markets that Tanzania and Mozambique should look at. Mozambique should consider how to integrate itself further into the southern Africa





regional economy because of its increasing energy needs. There is a need for new refineries to cater for domestic needs in east Africa but this risks becoming a badge of national honour, like national airlines once were, with each country wanting its own.

### LESSONS TO BE LEARNED

Lessons for east Africa's new energy states are clear. Independent institutions and oversight should be strengthened, records of all taxes and royalties from oil should be published, prestige projects and extravagant consumption must be avoided and authorities should not neglect opportunities to create meaningful employment. Africans need jobs, but the oil and gas industry itself never employs enough. The key is to use any oil funds to build up a competitive economy. It is also important to remember that 38 out of 54 African countries – over two-thirds – are still net importers of oil, and so oil price volatility remains a major challenge. In the past, high oil prices have contributed to riots and demonstrations as food and transport prices rose.

Most importantly, governments that have newly joined the oil

and gas club need to manage expectations. They should expect lengthy delays before production and expect high sunk costs and long production periods. International investors should also not underestimate likely time lags and delays, and the associated cost of capacity building.

East Africa offers the chance to use newly found oil and gas to enhance regional development and integration, and not repeat the mistakes of others. The region's political leadership needs to show vision and foresight by being strategic in using these resources to enhance regional infrastructure, diversify its economies further, and invest in education to reduce poverty and create globally competitive economies. Choosing international partnerships carefully will be part of the challenge. A senior Tanzanian parliamentarian reflected that 'A Chinese consortium offered to provide infrastructure, but wanted oil concessions, land and more in return. It was too much, and we allowed the deal to collapse.' When it comes to oil, African states are in the driving seat. They have the agency.

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# CEC – AFRICA'S EMERGING ENERGY INFRASTRUCTURE DEVELOPER



The Copperbelt Energy Corporation PLC (CEC) envisions itself becoming the leading Zambian investor, developer and operator of energy infrastructure in Africa; an ambition that appears not far from being realised.

Domiciled in Zambia, CEC is an independent power transmission and distribution company, with interests in closely linked businesses in Zambia and the African region, including optic fibre based telecommunications. Listed on the Lusaka Stock Exchange, CEC is a member of the Southern African Power Pool and has a deep insight into the mining industry, enabling it to provide quality electricity and other power products and services to the majority of the mines in Zambia, Africa's largest copper producer.

Africa is hungry for development, which means that it is hungry for infrastructure – since no meaningful and sustainable development can occur in the absence of enabling infrastructure in all spheres of economic endeavour. CEC is well positioned as a developer of energy infrastructure in Africa, and is respected in the region for its skills in designing and operating transmission systems.

Over the last few years, CEC has been extending its footprint beyond Zambia's Copperbelt Province, where most of its mining customers are based, and into other fields beyond electricity supply.

## POWER GENERATION

An emerging independent power producer, CEC has some strategic generating projects in the pipeline at different stages of development. Within Zambia, CEC is developing the 40 MW Kabompo Hydro Project. This greenfield project is located in the north-west of the country – an area with massive mineral deposits and already attracting huge investments from some of the world's biggest mining players. This is the first hydro plant to be developed in that geographic location, bringing with it benefits not only in terms of creating employment for local people, but also in diversifying the supply of power away from the country's south.

The scheme will also help reduce the country's power deficit, create a source of emergency power for the area, and have a stabilising effect on the grid. It may also become a possible source of power supply for the new mines in the area, and the province generally.

Early construction work on the project is due to begin by the end of March 2013, while major engineering–procurement–construction (EPC) works await financial close, anticipated for the second quarter.

CEC is also carrying out feasibility studies for different hydro schemes along the Luapula River in the northern part of the country. A shared resource with the Democratic Republic of Congo

(DRC), the Luapula River is capable of accommodating five different schemes, with an estimated combined generating capacity of between 800 and 1,560 MW.

## TRANSMISSION PROJECTS

With existing mines expanding their operations and new mines coming on board, CEC continues to develop transmission infrastructure to effectively support the power needs of its customers. This includes substations and transmission lines, and upgrading of some power systems. The two generation projects discussed earlier also require construction of associated transmission infrastructure.

Progress has been made towards construction of a new dual circuit 220 kV interconnector between Zambia and the DRC, to enable the transmission of 550 MW power between the two countries on a firm basis.

## RENEWABLE ENERGY

The company's Renewables Unit was set up to explore ways of developing renewable energy technologies, in an effort to diversify CEC's energy source mix. In addition to a biodiesel plant that has been in operation for a few years now, CEC is in the process of setting up power plants which will make use of the wood waste generated by the timber processing industry on the Copperbelt.

One such biomass gasification power plant of 1 MWe, located in Kitwe, is in advanced stages of the



Environmental Impact Assessment process, while the preliminary work has begun for setting up a similar plant in Ndola, some 61 km away.

Associated with the Kabompo Hydro Project, CEC intends to put up a 10 MW solar PV park, a 10 MWe biomass generation project and a 1 MWe biomass gasification power plant.

### TELECOMS INFRASTRUCTURE

CEC has two subsidiary companies operating in the telecoms industry. Realtime Zambia is a retail internet service provider, focused on the niche corporate sector market and providing high speed internet services and private leased circuits using fibre optic technology; while CEC Liquid Telecom – a joint venture between CEC and Liquid Telecommunications of Mauritius – is a wholesale broadband connectivity telecommunications company both in Zambia and within the region.

In 2011, CEC Liquid opened up a second fibre gateway, providing alternative access to a single international gateway that Zambia had relied on. A positive result of this development is a marked reduction in internet provision costs, enabling retail operators such as Realtime to pass on discounts to their clients. Consequently, the retail internet price fell by about 70 per cent between 2010 and 2012.

Communications is a critical factor of any development, and the right infrastructure to fulfil ICT needs must be developed as a matter of urgency in Zambia and the region.

### INVESTING IN AFRICA

To enable the company to realise its vision of becoming a leading investor, developer and operator of energy infrastructure in Africa, a new company has been formed. CEC Africa Investments Limited (CEC Africa) is the vehicle through which CEC will undertake international investments in the power sector in sub-Saharan Africa.

Investments to be undertaken by CEC Africa include a heavy fuel oil generating plant in Namibia. The 120 MW Arandis Power project is located in the mining town of Arandis. Waste oil will be processed to generate power.

An investment at a more advanced stage is the acquisition of a 60 per cent interest in Nigeria's Abuja Electricity Distribution Company (AEDC), one of the units being offered under Nigeria's power sector privatisation drive. CEC Africa acquires the stake in AEDC as part KANN Utility Company Limited, a consortium in which CEC is a 50 per cent joint partner.

### BUILDING THE FUTURE

CEC prides itself at being a partner of choice in development. With

over 50 years of experience as an energy operator, supplying power to a unique set of customers with highly specialised requirements, the company understands the necessity for infrastructure in Africa, particularly in energy and telecommunications.

Southern Africa is going through a marked period of power supply deficit, making the need for investment in power generation critical. CEC is taking an active role in contributing to the investment and infrastructure needed to support Africa's growth, in order that the momentum can be sustained.

### CEC PROMINENT FACTS

- Over 50 years of experience in supplying power to the mines, including some of the world's wettest mines
- Circa 900 km of 220 kV/66 kV transmission lines
- 520 km of optical fibre on power lines
- 38 high voltage substations with dedicated control centre
- 80 MW embedded thermal generation
- Power transmission for Zambian and DRC national utilities
- Owner and operator of the Zambian part of the Zambia–DRC interconnector line
- Supplier of over 50 per cent of power consumed in Zambia.

Website: [www.cecinvestor.com](http://www.cecinvestor.com)

# EAST AFRICAN ENERGY INFRASTRUCTURE



**Luzze Andrew Kaggwa**, Executive Director of the **East African Business Council**, assesses the opportunities and challenges of developing energy infrastructure in the East African Community.

The East African Community (EAC) has an estimated population of about 132 million, and an estimated total GDP of US\$80 billion. The growth of the economy in the last decade has been spectacularly positive, estimated at about 5 per cent a year. Strong business prospects in the EAC are largely underpinned by regional integration initiatives, which have consolidated a fragmented market into one of the biggest in sub-Saharan Africa (SSA), with market-based trade and investment regulatory reforms; macroeconomic stability in most cases; and political willingness to adhere to reforms supporting business development and growth.

Despite the above, the region has more than 81 per cent of its people living without access to modern energy services. Cities and towns account for 40 per cent of the

consumption of electricity from the grid, while rural households only access 5 per cent of modern electricity services.

In addition, the electric power supply in EAC falls far below the demand. For instance, the current peak electric power demand is estimated to be above 3,000 Mega Watt (MW) and it is projected to grow at over 10 per cent annually over the next 10 years, to about 5,200 MW by 2018. This demand growth is driven by an accelerated consumer connection policy and anticipated robust economic growth performance.

The region has the potential to reverse this adverse situation, but there are constraints that hinder the harnessing of the opportunities in the sector.

On the supply side, key constraints limit the rate of access expansion. Firstly energy resources, such as hydropower, wind, solar and biomass energy, despite their potential, are poorly utilised in eastern Africa. Secondly transmission and distribution lines, and related power evacuation infrastructure, continue to place constraints on power supply, with poor inter-state connections. Thirdly technical and non-technical power shedding are substantial in eastern Africa, limiting the rate at which electricity can be delivered to new customers. Fourthly the high cost of technologies limit the optimal zone within which energy services can be economically provided. Fifthly lack of access to finance and public and private sector capital continues to constrain energy development.

## INFRASTRUCTURE OPPORTUNITIES

All in all, EAC has enormous energy prospects that can be developed if the constraints are eliminated or are brought to minimal levels. Some of the priority opportunities for expanding the energy infrastructure in the EAC are described in the following paragraphs.

Technical and non-technical power shedding are substantial in eastern Africa, limiting the rate at which electricity can be delivered to new customers.

### Transformer manufacturing.

In order to achieve the regional objective of connecting one million customers in the next five years, a total of 60,000 transformers will be required. It is also estimated that an additional 2,000 transformers will require repairs annually.

**Coal fired plant.** The government of Kenya has commissioned a feasibility study on the establishment of a 300 MW coal power plant in Mombasa, with three suitable sites identified. The plant will require about one million tonnes of coal per year, all of which will have to be landed at the Mombasa port and transported to the power station.

**Coal exploration and exploitation.** The government

Country <i>Selected eastern Africa countries</i>	Electrification rate (%)	Population without electricity (millions)
South Sudan	1	9.3
Uganda	9.0	28.1
DR Congo	11.1	58.7
Tanzania	13.9	37.7
Kenya	16.1	33.4
Ethiopia	17.0	68.7
Madagascar	19.0	15.9
Eritrea	32.0	3.4
<i>Selected sub-Saharan African countries</i>		
Malawi	9.0	12.7
Burkina Faso	14.6	12.6
Lesotho	16.0	1.7
Zambia	18.8	10.5
Benin	24.8	6.7
Angola	26.2	13.7
Namibia	34.0	1.4
Sudan	35.9	27.1
Gabon	36.7	0.9
Congo	37.1	2.3
Zimbabwe	41.5	7.3
Senegal	42.0	7.3
Botswana	45.4	1.1
Cote d'Ivoire	47.3	11.1
Cameroon	48.7	10.0
Nigeria	50.6	76.4
Ghana	60.5	9.4
Mauritius	99.4	0.0
<b>Sub-Sahara average</b>	<b>30.5</b>	<b>585.2</b>

Figure 1. Energy access rates in select countries in eastern and sub-Saharan Africa  
Source: World Energy Outlook, 2011

of Kenya is currently carrying out coal exploration in the Mui basin in Mwingi district, which covers an area of 400 km<sup>2</sup>. This basin is 180 km north east of Nairobi. So far 33 wells have been drilled with depths ranging from

75 – 324 metres, and coal seams were encountered in 20 of them. Coal sample analyses have revealed that the coal is sub-bituminous to bituminous in quality, with an average calorific value of 18 MJ per kg.





**Petroleum exploration.** The EAC has unknown reserves of petroleum. There is total commitment in the region to develop petroleum exploration and production as a means of reducing the import bill. In this regard, Heritage Oil and Gas Ltd of the UK has completed a detailed seismic interpretation of Semuliki Basin. A subsidiary of Amoco has an oil exploratory concession in and around Lake Tanganyika.

“The potential for private sector participation in the development of solar photovoltaic systems is very significant.”

**Renewable energy.** Increased use of solar and wind energy for industrial and domestic use will promote use of environmentally

friendly technologies, helping in water conservation and protection of water catchment areas. In addition these technologies will also reduce the dependency on oil-based energy sources.

**Solar electricity generation.** Solar represents a major form of energy in the EAC and plays a significant role in preserving most food crops, beverages, tobacco, fish, meat and sawn timber. Solar water heating can save considerable energy in hotels, hospitals, factories and homes where the current electric grid system is not available. This source of energy could be substituted to some extent for fuel wood to enhance environmental preservation.

The potential for private sector participation in the development of solar photovoltaic systems is very significant in such areas as the manufacture of solar panels, their installation and after-sales services. The EAC lies astride the equator, and a vibrant solar energy market has developed over the years for providing electricity to homes and institutions remote from the

national grid and for medium temperature water heaters for domestic and commercial usage.

**Wind power generation.** To facilitate decision making in wind power generation investment, some governments are undertaking wind data logging in high potential areas. However, detailed feasibility studies would need to be carried out to determine the viability of specific sites. Preliminary wind resource assessment shows that wind regimes in certain parts of Kenya (such as Marsabit, Ngong and the coastal region) can support commercial electricity generation as they enjoy wind speeds ranging from 8 – 14 metres per second. This preliminary assessment has been used to develop a wind map for the whole country. The north east region of Uganda has effective strong winds. Windmills have been installed in Karamoja for pumping water. This source of power can also be used for grain milling.

**Hydropower development.** There are a number of potential hydropower plants in the EAC region. Although hydro plants have

not been considered economical in the past, recent oil price increases now make them attractive for investment. Some of the potential hydropower opportunities exist in the following areas:

- Mutonga on the Tana River, with an expected capacity of 60 MW and an annual average electricity generation of 336 GWh. The estimated cost of construction is US\$270 million.
- Downstream of the Mutonga site is the Lower Grand Falls with a projected capacity of 140 MW and annual average electricity generation of 715 GWh. These sites provide a good potential for investment in hydropower.
- Enhancing the productive capacity of two hydropower stations (Ntaruka and Mukungwa) in Northern Province in Rwanda; together these stations have a productive capacity of 23.5 MW but are presently only producing about one-quarter of this amount.
- The Karuma dam hydropower project producing 800 MW.
- Construction of a mini-hydro plant at Lower Kihansi hydropower plant, located in the Ududzungwa escarpment, utilising a head of 850m with an installed capacity of 180 MW.

**Biofuel production.** Bio-energy is the energy derived from various sources of solids, liquids and gaseous biomass, including fuel wood, charcoal, ethanol, biodiesel and biogas. Bio-energy is currently the focus of attention due to dwindling global resources of fossil fuels and rising prices. Their potential to mitigate climate change add their attractiveness. Biogas can be generated from organic wastes of grass, weeds, aquatic plants, crop waste and farmyard manure. It is estimated that over 200,000

tonnes of cattle manure is available annually in the EAC region.

“Although hydro plants have not been considered economical in the past, recent oil price increases now make them attractive for investment.”

**Liquid fuels.** These include ethanol and biodiesel, and have a direct bearing on the level of the crops needed as feedstock. The EAC has both a starch-based crop (cassava) for ethanol production and simsim (sesame) for biodiesel. *Jatropha*, a plant grown in arid and semi-arid lands of Kenya, can be a good source of biodiesel.

**Geothermal energy.** The potential for geothermal power is evident from the hot springs found in the western region of Uganda, around the shores of Lake Albert, with temperatures ranging from 50°C-100°C. There are three potential geothermal fields: the Katwe volcanic field to the south; the Buranga field at the foothills of Rwenzori mountains; and the Kibira field in the northern part of the Rift Valley near Lake Albert. Of these three sites, the Katwe field is the most promising, as well as famous for its explosive craters and saline lakes. The geothermal resources in Kenya are concentrated in the Rift Valley with an estimated potential of over 4,000 MW. Out of this resource potential, 130 MW has been developed for electricity generation.

**Peat.** This form of fuel can be obtained in abundance, in the central part of Uganda, particularly around Lake Kyoga. It is bulky and remote from most potential consumers. So far, no work has been carried out to determine the feasibility of its production and marketing. Wood and peat account for 94 per cent of energy consumption in Burundi. Peat offers an alternative to increasingly scarce firewood and charcoal as a domestic energy source.

**Luzze Andrew Kaggwa** is the Executive Director of East African Business Council, with 12 years experience in private sector development, particularly in the areas of microfinance, industrial development and small and medium enterprises.

**East African Business Council (EABC)** is the apex advocacy body of business associations of the corporate and private sector from the five East African countries. It was established in 1997 to foster the interests of the private sector in the integration process of the east African community. The EABC's vision is to be an effective change agent, fostering an enabling business environment for a diversified, competitive, export-led, integrated and sustainable economy. The Council's mission is to promote the private sector's regional and global competitiveness in trade and investment.

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# OPERATING IN SUB-SAHARAN AFRICA

*George Zakhem the Chairmen of Zakhem International Construction Group, shares the insights and experience he has gained during his time operating in Africa.*



The shift in the world's commercial power has seen the Asian countries spreading their wings over the African continent. China, Japan and India, even South Korea, have become key players in the development of a continent ripe for growth on a grand scale unheard of during the past four decades.

The Commonwealth, an institution that has encouraged rapprochement between its members has, since its inception, contributed greatly to achieving its aim by opening these areas to the outside world through their stimulation of dialogue and their close proximity to the needs and culture of the diversity of people who inhabit this vast African continent.

Rich in its huge natural resources, Africa dwarfs anything we have seen so far. Meanwhile the West has been in a state of slumber unlike the Asians, alert to the great potential Africa was offering, who have spared no effort or initiative in their quest to wrestle with opportunities that can bring ample reward to their enterprises.

Zakhem Construction UK's first dealing with sub-Saharan Africa (SSA) was when we moved to Kenya in the mid-1970s to construct the first oil product pipeline linking the coastal city Mombasa to the capital Nairobi. This 450km pipeline heralded our first project in a SSA country, as part of a pipeline project extending to the neighbouring country of Uganda and financed by the World Bank.

This was our second country in Africa after having been in Libya 10 years earlier doing a multitude of other projects. Shortly to follow, our work was extended to Tanzania for the refurbishment of the oil pipeline from Dar es Salaam to the Ndola refinery in Zambia. It was an eye opener to discover the great opportunities ahead for a company of our size to work in SSA. Since then, various

types of infrastructure projects have been awarded to us in different countries, most notably:

- Road construction in Tanzania and Botswana
- Oil and gas pipelines in Nigeria
- Water supply in Kenya and Nigeria
- Oil storage depots in Kenya, Ghana and Nigeria
- Residential buildings in Senegal
- 250MW power generation stations in the Congo and Ghana

To date, we have constructed over 2,600km of oil and gas pipelines (8-42inch diameter) and 1,700km of water pipelines (6-62inch diameter) in SSA.

Since the beginning of the 1990s, the governments of the SSA region initiated a vigorous programme to invest in the infrastructure of their countries. Nigeria as a case in point, constructed over 3,000km of oil and gas pipeline networks for domestic and industrial use by consumers throughout the country. They also constructed the West African gas pipeline (WAGP) to supply natural gas to Togo, Benin and Ghana. The pipeline is in now in full operation.

Zakhem Construction was responsible for the construction of the gas metering and regulating stations along the line in Lome (Togo) and Cotonou (Benin). We are now in the process of constructing a twin cycle 250MW power station for the government of Ghana, which will be supplied by gas from this source. SSA cross border projects of this nature are beneficial to the development of infrastructure and potential growth.

Funding of infrastructure projects varies significantly across different sectors. Some are financed by the state, others by overseas development aid (ODA) and still others by private investors. Zakhem Construction has taken the decision to invest in tourism and power generation.





Images, left to right:  
Kempinski Hotel, Accra, Ghana  
36"inch Pipeline, Nigeria  
250MW Power Station, Republic of Congo

In the mid-1980s, we developed the exclusive five star Intercontinental resort hotel on the coast of Mombasa Kenya and we are currently completing the five star Kempinski hotel in Accra Ghana, which will be in operation in August this year. Kempinski hotel is located on the Cascade site, a major development project on 35 acres of land in the centre of Accra. Other buildings on the site will include residential and office buildings and a commercial centre (given the name of Gold Coast City Centre). The total built up area of this development will cover 350,000 square meters at an estimated cost of around US\$1 billion, all funded by private investors. The Kempinski hotel comprises of 269 rooms and suits, a spa, 6,500 square meters of shopping mall and a covered car park. It will be one of the top rated hotels in SSA.

The investment in power generation kicked off by signing a contract with the government of Mali, just one week before the civil war started. Our group will finance the engineering, construction and operation of a 75MW power station that will supply output to the government at a fixed cost. Negotiations are presently in progress with two other countries to conclude contracts with similar terms.

In general, the market in SSA is a wide open one in all sectors. With a total population exceeding the 800 million mark, consumer demand is very high and growth must be sustained for the economies in Africa to prosper and provide its people with an improved standard of living, putting an end to the recurring miseries of starvation and want.

The USA had been slow to invest in Africa, but is beginning to take a more positive interest. Three of their commercial airlines have started flying from New York and Atlanta to the west African cities of Accra and Lagos. It is a good beginning as travel is the gateway for opportunity. The more mobility the better chances

**“It was an eye opener to discover the great opportunities ahead for a company of our size to work in SSA.”**

of discovery and the more likelihood of a commercial outlook that will eventually lead to an awareness of the great possibilities that lay ahead.

The USA when awakened has the habit of mustering all its capabilities and diplomatic influence to back their vast corporations, in a way unlike any other nation. They usually mean business, and follow it with great ardour in order to achieve their objective. They have turned diplomacy into a commercial art form which I have witnessed on many an occasion.

From a commercial perspective, western countries especially the UK can ill afford to ignore the rising opportunities in Africa and should re-assess their priorities. Lost opportunities can never be resuscitated. One must strike while the iron is hot. The fierce competition between countries will grow with the passage of time.

Europe and the USA have the capacity and the know-how to make a great difference to the evolution of the African continent. Their involvement will be mutually beneficial.

One must also remember that Africa is now exploding in wealth and zeal, which will propel it to a new horizon where poverty will no longer be the plague that has afflicted it for centuries past; the dignity of their people is an imperative worth fighting for. The West can help and will be adequately compensated for their effort. They simply need to wake up and be counted.



**ZAKHEM**



# FINANCING RENEWABLES IN DEVELOPING COUNTRIES



**Adnan Z Amin**, Director-General of **The International Renewable Energy Agency (IRENA)**, discusses how good national policy design can overcome the barriers to renewable energy finance in developing countries.

Renewable energy has made significant strides on the world stage in recent years and developing countries have been at the forefront of this progress. Global financing for renewable energy in the developing world grew to US\$89 billion by 2011, more than doubling the level of investment in only four years and accounting for a third of new total global investment. Despite this encouraging picture, the sector has yet to reach its full potential. Renewable energy (RE) finance in developing countries faces a host of barriers.

In December 2012 the International Renewable Energy Agency (IRENA) and the Basel Agency for Sustainable Energy (BASE) brought out a report, *Financial Mechanisms*

*and Investment Frameworks for Renewables in Developing Countries*, to encourage policy-makers to design more effective renewable energy finance policies and programmes and unleash the great benefits renewable energy has to offer to the developing world. This article summarises some of the report's findings.

Developing countries with growing economies have pressing needs for new power capacity and, in many cases, have large potential for RE resources; such as strong winds, extensive sun irradiation, substantial geothermal reserves, abundant feedstock sources for biomass, or large landfills for waste-to-energy. RE can be economically viable if markets can learn how to account for externalities (the social and environmental costs

☞ In many developing countries, national policy has already played a decisive role in making RE markets more attractive. ☞

incurred by conventional energy production), and for the value of long-term success. Therefore, to ensure a successful and sustainable future, governments are taking action to encourage and facilitate RE financing. In many developing countries, national policy has already played a decisive role in making RE markets more attractive.

At the same time, whereas regulation is required to account for externalities, deregulation is in some cases required to improve the pricing of technologies and services. Moreover, in addition to regulatory frameworks, there are other targeted actions that can be taken according to the sequencing of infrastructure, technical and capacity measures that enable deal-flow throughout RE markets.

### RE INVESTMENT IN DEVELOPING COUNTRIES

In 2011 total new RE investments (US\$89 billion) in developing countries rose 10 per cent compared with the previous year, to about 35 per cent of total new global investment. Earlier data demonstrates that in 2005, developing country financing activity already rivalled the dominating developed countries, led by China, India and Brazil, with asset finance in particular driven largely by Chinese investments in wind energy. Developing countries other than these three have also experienced significant increases in investment. Figure 1 shows the breakdown of total RE investments among developing countries in 2011. China remains the top investor worldwide with US\$52.2 billion, showing a 17 per cent growth rate over the previous year. However, the USA was a close competitor in 2011, with a 57 per cent surge in its investment in the RE sector.

Overall, RE investment in the developing world has been particularly active in wind energy projects, reflecting the maturity of wind technologies and the broader wind market. Investment in solar energy has also been on the rise, driven most recently by a substantial decrease in the cost of photovoltaic (PV) technology. Biomass and waste-to-energy

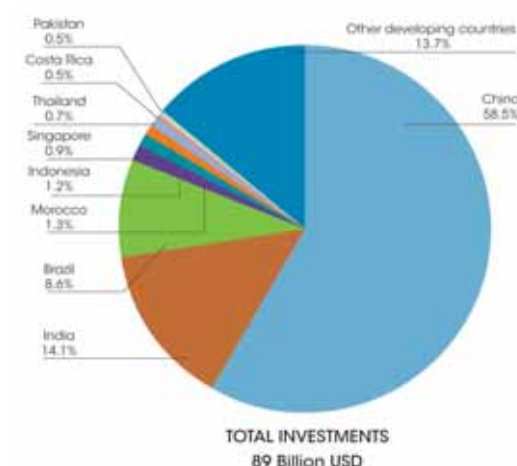


Figure 1. Financial new investment in renewable energy in developing countries, 2011

Source: based on the Global Trends in RE Investment report (UNEP, BNEF and FS, 2012)

projects, as well as biofuels and small hydro, make up another important component of total RE investments in developing countries. Geothermal energy has caught the attention of some countries, such as Kenya, Nicaragua and Indonesia, and has seen an increase in investments as well. However, overall, the most dynamic areas of cost reduction are currently distributed and mini-grid solutions.

“The most dynamic areas of cost reduction are currently distributed and mini-grid solutions.”

The financial crunch had a less negative impact on overall RE finance trends globally in 2011 than in the previous year. India, China and Brazil make heavy use of public banks (comprising 74 per cent of the banks in India, at least 69 per cent in China, and 45 per cent in Brazil), which proved more resilient than private banks to the financial crisis.

While sovereign interest rates are at historic lows, risk and liquidity premiums are at or near historic highs, which means that, together with a number of reforms after the financial crisis (Basel III, Solvency II) long-tenor bank lending for all forms of infrastructure has dried up. It may be replaced by bond markets, sovereign wealth funds and institutional investors (insurance companies and pension funds), but that is not certain and will take time.

The financial crisis has also led to a strong increase in global commodity prices, including the price of raw materials for biofuels and biomass energy production.

RE investors in developing countries include governments, banks, equity firms, insurance companies, pension funds, industry bodies, clean energy companies, and start-up project developers. In the aftermath of the financial crisis, public institutions have played a critical role in providing capital that was otherwise unavailable from private sources.

For many developing countries, national development banks are the central actors in local RE finance. Multilateral development banks (MDBs) also lead and frequently

partner with national banks on RE investments. South-south (as opposed to north-south) finance flows are expected to deliver international RE investment in developing countries in the future.

“The developing world is characterised by greater real or perceived market risk due to its less stable macroeconomic conditions.”

#### **BARRIERS TO RE INVESTMENT**

Persistent barriers to RE investment in developing countries span the economic, political, legal, technical and non-financial spectrum. For any given RE technology, these barriers change as the market for that technology develops. Broadly speaking, the developing world is characterised by greater real or perceived market risk due to its less stable macroeconomic conditions. The perception of higher risk leads to higher borrowing costs (i.e. interest rates), shorter loan tenor and higher equity requirements in these countries. The general reluctance of commercial investors is exacerbated by limited understanding of RE investments, and the unique risks and high up-front liquidity needs of these technologies. This is further impaired in countries that have poor frameworks for foreign direct investment (FDI). Generally, RE investment has followed broader trends in FDI.

An overarching barrier that affects developed and developing countries alike is the failure of energy pricing to account for externalities, or for the environmental and social costs of production. This has suppressed RE technologies for decades by making them appear more expensive when compared to conventional energy sources. Unfortunately, most governments provide substantial subsidies to fossil fuels, giving them an even greater market advantage over RE technologies.

Often, there is too little focus on developing a national supply chain that supports local employment and manufacturing (e.g. through local R&D and business and project development assistance).

Developing countries also face higher foreign exchange risks when sourcing international funds. Although financial instruments to hedge this risk are available for commonly traded currencies, the private sector appears unwilling to cover currencies traded less frequently. Currency risk is therefore a greater problem for developing countries that do not use major currencies. Even for those that do, however, hedging becomes prohibitively expensive as the tenor increases. Given that RE requires 12–15 years funding, hedging in any currency combination is difficult to do.

In some countries, uncertain policies create an ambiguous investment climate. Costs and payment obligations for feed-in tariffs require up-front clarity and a lack of such clarity or security around the backing of power purchasing agreements (PPAs) can cause problems. In some cases (e.g. India), utilities have been unable to pay for purchasing power at agreed tariffs and have had to take on debt to stay afloat.

Infrastructure challenges are particularly acute for RE deployment in developing countries, often increasing the risk associated with RE investments and, in extreme cases, preventing a prospective project from being realised. Key examples of infrastructure challenges include system constraints, lack of grid access, high grid connection costs, limited grid capacity and coverage, lack of technical standards and certification, and lack of operation and maintenance facilities. In many developing countries, the best RE resources are located in areas that are far from the national transmission grid or are not well served with other forms of basic infrastructure, such as roads.

“RE investment has followed broader trends in FDI.”

Finally, relevant knowledge and capacity among various players involved in the RE finance arena in developing countries are often limited. There is less experience with RE project finance structures, limited equipment operations and maintenance expertise, and a greater need for technology transfer support. It is therefore especially important in developing countries to pair RE finance with capacity building efforts.

#### **A NATIONAL RE FINANCE STRATEGY**

Effective national policy is critical to create the kind of markets that financiers will find attractive. In developing countries, strong RE policies have proved easiest to justify in markets that are highly

dependent on energy imports, such as Morocco and Chile. A holistic approach, tailored to the local context, would combine a supportive regulatory framework with targeted interventions.

To shift finance into RE, there are central roles that must be performed by governments. At the same time, there are some roles that should not be performed by governments. In particular, attention should be paid to whether any proposed regulation supports the process of price discovery to drive down RE costs. Where regulation inhibits this process, deregulation or regulatory reform may be appropriate to enable entry and exit of new RE providers into and out of the local markets. Furthermore, given that RE investment has followed broader FDI trends, countries that have poor frameworks for FDI in general cannot expect to attract overseas RE infrastructure finance. The macroeconomic reforms necessary to attract FDI more broadly will also enable increased foreign investment in RE.

In general, governments should seek to mobilise RE finance in two comprehensive ways: firstly by setting overarching regulatory and incentive frameworks that shift investment into RE on a macro level; and secondly by using targeted public funding to fill or overcome specific financing gaps and barriers. Regulatory frameworks can employ both energy policy mechanisms (e.g. feed-in tariffs, quotas, tax incentives) and finance policy mechanisms (e.g. banking regulations, interest rates, other monetary policy approaches, 'Green Bonds' schemes and creation of new financing institutions). As mentioned, deregulation within local energy markets is important to allow free entry and exit of new RE players, and to create and facilitate competition among providers.

Targeted intervention implies RE public finance mechanisms combined or coordinated with accompanying non-financial interventions, such as RE capacity building and knowledge management.

“In developing countries, strong RE policies have proved easiest to justify in markets that are highly dependent on energy imports.”

Both the regulatory and public finance approaches are important. At the same time, public finance should not be used as a substitute for underlying policy change when the latter is the more appropriate way to overcome a particular investment barrier or risk, so long as there is the option of making the necessary systemic improvement. Furthermore, it is important to embed RE support and other specific policies into the broader energy policy. Feed-in tariffs and other supports, while very important, are not enough for RE market policy. Issues like planning, grid connection and capacity, and PPAs are part of the deal cycle that the overall policy frameworks must address.

Because markets have been unable to incorporate externalities into the price of energy, government action is required to level the playing field until prices reflect the true costs of production. This can be achieved in part by shifting

existing subsidies away from fossil fuels and towards RE.

National governments can help empower the financial sector to deliver a RE future by incorporating sustainability considerations directly into financial and monetary policy – such as in Costa Rica, where the Ministry of Finance is designing environmentally responsible bonds modelled after the World Bank's successful Green Bonds scheme; or in Japan, where the central bank in 2010 established preferential interest rates for environmentally friendly sectors. Governments can set up specialised RE financing vehicles along the lines of the Indian Renewable Energy Development Agency (IREDA); or they can introduce guidelines and regulations based on the Equator Principles, the UN Principles of Responsible Investment (PRI), or other existing initiatives that integrate sustainability considerations directly into the financial decision-making process. They can also engage global finance policy groups to include sustainability considerations within the analyses and recommendations of authorities such as the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision, whose policies have a record of successful adoption across the financial sector worldwide.

At this time, however, RE finance policy is most commonly designed not by central banks and finance ministries, but by energy and environment ministries. These entities employ policy mechanisms such as feed-in tariffs and tax incentives to help shape the RE investment landscape. While it is important to change the market baseline to include externalities and long-term sustainability in financial accounting, attention must also be paid to the sequencing of technical and infrastructure development for RE markets, which is where these



agencies are particularly active. Even basic self-supply regulation has served as an initial catalyst for RE markets in some developing countries, such as in Mexico. In South Africa, government energy auctions have promoted investment in biomass, wind, hydropower, and solar PV. Between 2008 and 2011, a total RE-based electricity capacity of over 6,900 MW was reached from auctions on small-scale hydro, wind and bioelectricity.

### THE HOLISTIC APPROACH

Every national RE market is unique. They are highly complex, living systems that involve a variety of technologies and sub-sectors at different stages of development, as well as distinct financing needs. There is therefore no 'one size fits all' policy formula. Rather, an effective RE finance strategy requires a holistic and nuanced approach that is tailored to the local context. This is exemplified by India, where a large range of policy measures and financial mechanisms have been differentiated according to local needs across different regions. The overall policy and financing mix, combining national and local strategies, has helped India to position itself as one of the most important markets for RE technologies.

Whenever possible, RE finance strategies should align themselves with local policy priorities in order to secure government support and engagement. Programmes may therefore seek to emphasise the employment, regional development, national security, poverty alleviation and energy access potential of the RE sector. The Brazilian RE finance framework, for example, places particular emphasis on maximising the employment and regional development impacts. When designing targeted interventions, the most meaningful

public finance programmes employ a flexible package of financing mechanisms, rather than relying on any single mechanism or fixed set of mechanisms. These packages may include lines of credit to local finance institutions; project debt financing; loan softening programmes; guarantees to mitigate lending risk; grants and contingent grants for project development costs; equity, quasi-equity and venture capital; or carbon finance facilities.

A common priority of public finance programmes is to maximise leverage of additional investment into RE sectors, which can be achieved so long as the financing instruments address one or more existing investment barriers. In principle, guarantees can leverage additional investment per unit spent better than either grants or direct loans – so long as borrowing costs are reasonably low.

It is not always the case that public finance must be spent where it can be directly recovered. Some non-recoverable expenses in the short term may constitute very important investments for the long-term. These can include: RE academic and laboratory research; small business development; public RE infrastructure investments; RE stakeholder coordination and knowledge management; and RE finance training and capacity building programmes.

While it may be possible to identify specific technologies that are most appropriate for a local context at a given time, it is unrealistic to assume that the best choice of technologies will not change in the future along with the science, policy structures and the economy. For this reason, it is better to take a more diverse 'portfolio approach' that can change over time, rather than choosing to support only a limited

set of technologies. An emphasis on capacity building in addition to financing is especially important.

**Adnan Z Amin** was elected as the first Director-General of the International Renewable Energy Agency (IRENA) in April 2011. In this capacity, he is responsible for leading the Agency in the implementation of its mandate to promote the adoption and use of renewable energy worldwide. Mr Amin, of Kenya, is a development economist specialising in sustainable development. He has over 25 years experience in international environment and sustainable development policy, as well as in the political, management, and interagency coordination functions of the UN, where he has held senior positions. He is currently a member of the UN Secretary-General's High-Level Group on Sustainable Energy for All.

The **International Renewable Energy Agency (IRENA)** is an intergovernmental organisation with the objective of promoting the widespread and increased adoption and the sustainable use of all forms of renewable energy. IRENA's participants include 158 states and the EU, out of which 100 states and the EU have ratified the Statute and are IRENA members. Governments, public and private organisations, academics and the media can draw on IRENA's extensive knowledge base and wide reaching expertise for a one-stop service that facilitates increased interest in, and adoption of, renewable energy technology and policies.

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# URBAN ENERGY POLICY DESIGN



African cities will play an increasingly important role in the sustainable energy challenge. As such, energy demand and generation requirements must be included in the early stages of city planning, explains **Maria van der Hoeven** of the **International Energy Agency** (IEA).

Over 70 per cent of global energy demand is consumed in cities, where roughly half of the world's population lives. Moreover, the urban population is expected to continue increasing rapidly due to growing urbanisation in emerging economies and developing countries, putting cities at the centre of the sustainable energy challenge. Africa will play a particularly important role, with the region accounting for fully 32.5 per cent of the global increase in urbanisation from 2011–2050.

Policy to ensure reliable energy supply and sustainable energy generation will generally be designed and implemented at the local level. But the impacts of national and regional policies on the overall urban policy package

must also be considered, as they will drive energy consumption and generation at the city level. Energy policies should therefore strive to create an effective link between national, regional and local needs. Several of the most important areas to address include city planning policies, building energy efficiency policies, transportation policies, and energy generation, distribution and delivery policies. Impact analyses of such policy areas should also employ a cross-sectoral approach. The link between energy and transport for example is apparent, but less obvious interdependencies can also be important, such as the interplay of energy policies with waste and water management.

Policy-makers should include energy demand and generation

requirements in the early stages of city planning policy design. A holistic approach is necessary, where not only traditional technology, but also passive solutions are considered. For example, this could include taking into account the local climate in city planning policies, in order for buildings to benefit or be protected from solar gains.

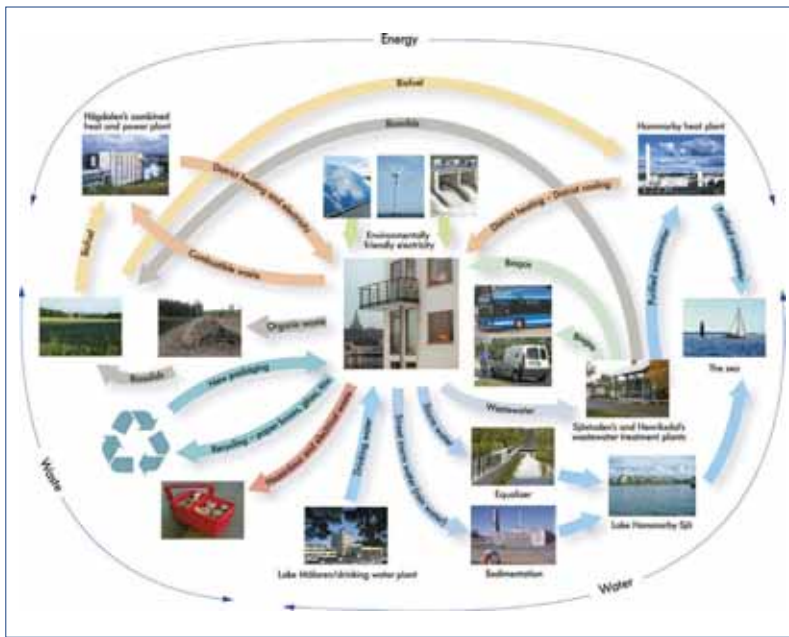
The nature of the energy sustainability challenge will require a range of solutions to promote strong cities, while reducing CO<sub>2</sub> emissions and dependence on traditional external energy sources.

## URBAN ENERGY POLICY PACKAGE

### City planning

City planning is a major policy driver of sustainable energy

Figure 1. Hammarby eco-cycle model



© hammarbysjostad

generation. It is therefore essential that city officials ensure that city planning accommodates various other policy goals, since it determines the urban density and establishes residential, non-residential and mixed zoning. These decisions can have a direct impact on building heating and cooling needs, the cost effectiveness of public transport, and the vulnerability of the built environment to extreme weather conditions. Overall energy therefore demand and supply needs can therefore be reduced by design as much as by technology.

### Buildings' energy efficiency

The buildings sector is the primary energy consuming sector at the city level. Energy efficiency policies for this sector should therefore be developed early on in the design of urban policy packages. These policy packages should include building energy codes and energy labelling schemes that aim to reduce the energy demand of both new and existing buildings, without compromising comfort levels. When implemented effectively, building energy codes can ensure

the deployment of energy efficient technologies and reduce the risk of blackouts during extreme weather conditions. Energy efficient buildings often yield greater year-round comfort levels, which in turn can be a low cost means to provide health benefits for its occupants. Reducing energy demand will lower pollution levels by cutting unnecessary power generation, and reduce urban heat island effects.

### Transport

Transport is the second energy consuming sector at the city level, and should similarly be considered early on in urban policy design. Transport policy to reduce energy consumption might include the implementation of efficient, high quality and safe public transport systems; schemes to discourage the use of personal vehicles, such as road pricing or driving and parking restrictions; and policies that turn multi-modal trips into seamless journeys, such as car-sharing and employee transport plans. Provision of infrastructure to support more and safer non-motorised travel (such as cycle lanes and better footpaths) can also play

an important role. Such policies not only reduce energy use and greenhouse gas emissions, but also bring substantial improvement in other environmental externalities, such as local air quality and noise. Mixing shopping and work areas with residential areas can also save energy by reducing the average distances city dwellers need to travel on a normal day.

### Energy generation

Sustainable city level energy generation policies should include plans for electricity generation through local renewable energy sources. Cities should thus aim to be centres for energy generation, where technically feasible and economically viable. These efforts should be concurrently supported by city planning and building energy policies, in combination with waste and water management programmes. Energy generation should be part of an integrated approach that includes energy distribution and delivery, and that can help to increase on-site renewable generation and the overall share of renewable energy. Such an integrated approach is not new. Since the Earth Summit in 1992, several cities around the world have implemented it. The approach was illustrated by the Hammarby (Stockholm) eco-cycle model (see Figure 1).

### Energy distribution and delivery

Policy-makers should consider smart grids, distribution management, and end-user energy delivery at the early stages of urban policy formation. Investing in smart grids can improve demand response, delivery of energy efficiency, integration of variable renewable resources and enable electric vehicle recharging services. Such grids also smooth demand peaks and stabilise the electricity system, helping to deliver effective energy savings.

Over 60 per cent of global energy demand is consumed in cities, where roughly half of the world's population lives.



Policy packages should include building energy codes and energy labelling schemes that aim to reduce the energy demand of both new and existing buildings.

#### CAPACITY BUILDING AND STAKEHOLDER INVOLVEMENT

In order to achieve effective implementation, resources should be secured for local capacity building and energy awareness programmes. As cities can benefit greatly from sustainable energy generation, it is important that they lead by example. Public buildings should be energy efficient and use renewable energy where possible; and local authorities should include the purchase of energy efficient products and goods in their procurement rules. Cities should also be mindful of transparency and include all stakeholders and interested parties from the

early stages of urban policy package design. Both stakeholder involvement and transparency are key to successful acceptance and implementation of such policies.

#### TOWARDS A SUSTAINABLE FUTURE

In the end, city planning including buildings, public transport, energy supply, waste and water management is about human well-being. Efforts should not focus merely on statistics or technology, but also be mindful of beautification and quality of life. Urban greenery programmes, for example, can increase quality of life while decreasing heat island effects.

This type of common sense, win-win solution is typical of good local integrated policy planning. Even if national policy takes the limelight, the real impact of energy policy will first be local. Given the importance of cities within the wider energy equation, addressing their particular needs in a sustainable, intelligent and efficient manner also enhances national energy security. Cities lie at the centre of the energy challenge, those in developing regions of Africa are important because that is where the growth is; making sound urban policy is key to the solution.

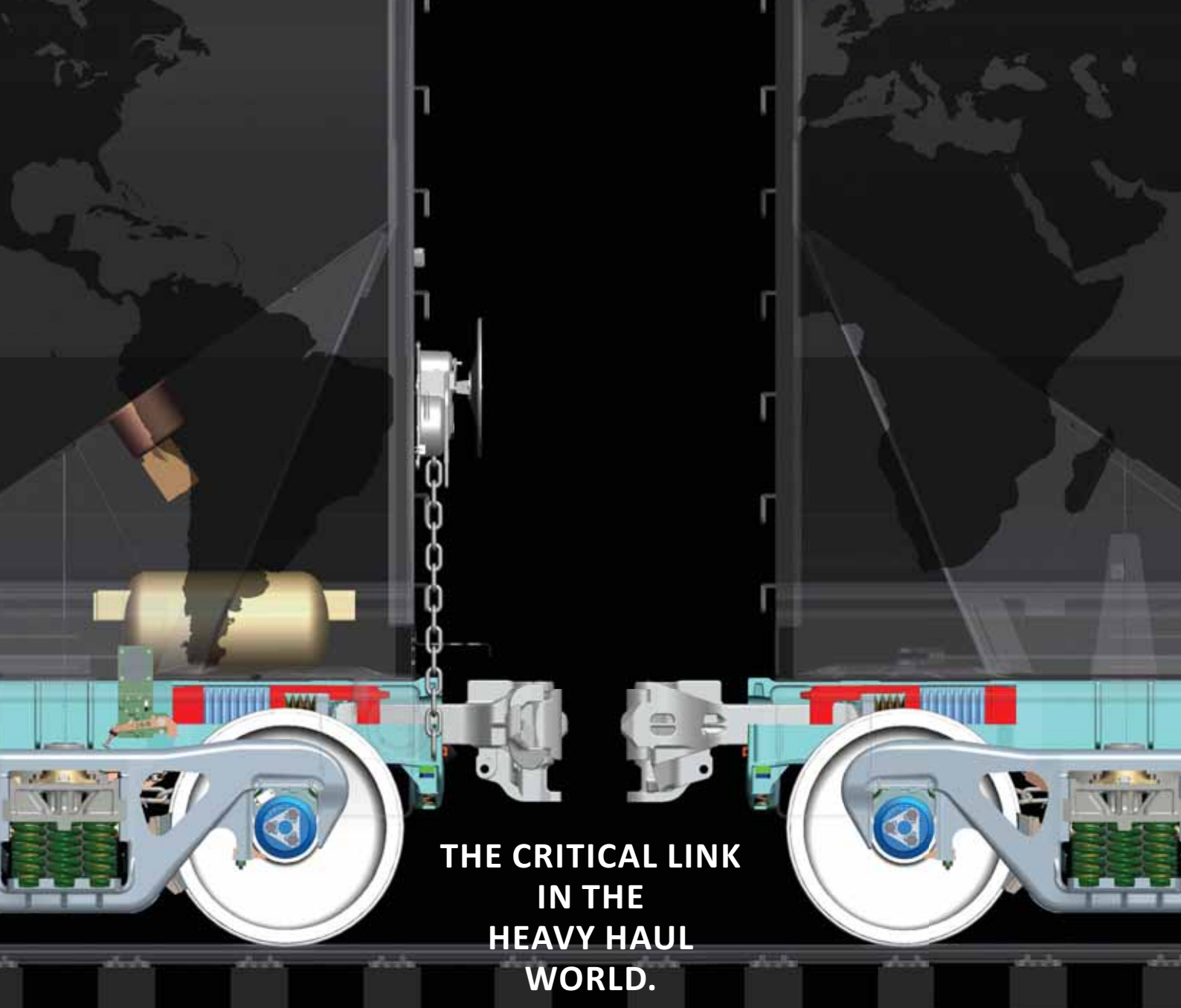
**Maria van der Hoeven** took over as Executive Director of the IEA on 1 September 2011. Previously, she served as Minister of Economic Affairs of the Netherlands from February 2007 to October 2010. As minister, Ms Van der Hoeven took the initiative in advancing several key aspects of her country's energy policy, including unbundling, infrastructure modernisation and extension, developing the Dutch gas hub policy and accelerating the development and use of renewables. She played an active role in European energy policy development, and helped to set up the Pentilateral Forum, which establishes cooperation on electricity between Germany, France and the Benelux countries. Before becoming Minister of Economic Affairs, she was Minister of Education, Culture and Science.

#### The International Energy

**Agency (IEA)** is an autonomous organisation that works to ensure reliable, affordable and clean energy for its 28 member countries and beyond. Founded in response to the 1973/4 oil crisis, the IEA's initial role was to help countries coordinate a collective response to major disruptions in oil supply through the release of emergency oil stocks to the markets. In addition, it is at the heart of global dialogue on energy, providing authoritative and unbiased research, statistics, analysis and recommendations. Today, the IEA's four main areas of focus are: energy security; economic development; environmental awareness; and engagement worldwide.

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Driving the  
transport agenda

# AFRICA'S TRANSPORT SECTOR: KEY CHALLENGES



**Dr George Banjo** of the **World Bank** depicts the nature of the transport sector in the emerging development agenda for Africa, and how the challenges can be turned into opportunities.

Why has transport, or the lack of it, being such an ever-present feature of Africa's underdevelopment?

Much of the answer is to be found in the political history of the continent, a history formed much by colonial interest, which is fragmented the continent into many small countries and created incomplete transport networks tailored to the evacuation of export products rather than integrating the country. Unfortunately, the main export-oriented transport mode, the railways, was built to minimum technical standards, and was thus unable to compete with road transport, which became the priority of political leaders after independence as part of a necessary process of national integration.

Another factor is the uneven political development, partly a legacy of colonial administration

and partly the result of internal tension between different ethnic groups and the over-presence of state enterprises in the development and execution of investment programmes – resulting a perverse allocation of resources, as programmes were driven more by political considerations than by their merits. Transport professionals and decision-makers have also been at fault, paying inadequate attention to the transport needs of the rural and urban areas and to the maintenance of installed transport infrastructure. As a result of these and other features of Africa's development such as corruption, its transport sector is more of a constraint on its development than it should be. However, addressing these problems provides opportunities for contributing to the development of the continent.

## TRANSPORT CHALLENGES

The main challenges facing the sector can be grouped into two: achieving efficiency gains through better management and use of resources; and responding adequately to the urbanisation and climate change agenda.

'The problem of Africa can be summed up in one word – transport!' So said Sir Frederick Lugard, the first colonial Governor-General of Nigeria, almost a century ago. Unfortunately, this characterisation remains largely the same today. Indeed, more recently, Julius Nyerere, former President of Tanzania, lamented that, 'While the great powers are trying to get to the moon, we are trying to get to the village.'



## The weakest links in the transport chain (rural or urban) are those used by the poor.

Economic forecasts suggest that (excluding China and India) growth in sub-Saharan Africa will be a major driver of global economic growth in the medium term. Africa is seen by many as the last frontier with untapped natural resources, with growth of its gross domestic product recently outperforming those in other regions.

The new confidence in Africa's development is a function of many factors which include:

- Improved political and macroeconomic stability
- Microeconomic reforms being seen as in the right direction
- Urbanisation, which is expected to create a new middle class whose household discretionary income is expected to increase by more than 50 per cent in the next decade
- Availability by 2040 of a labour force of over one billion, comparable to India or China.

According to the World Bank, the key development agenda for Africa in the medium term involves:

- Increasing competitiveness and creating more jobs by removing investment climate constraints, improving business environment, developing skills and macroeconomic stability
- Reducing vulnerability and increasing resilience, largely by responding adequately to issues relating to climate

change, political violence and social equity – particularly by achieving the millennium development goals (MDGs), and

- Improving governance and public sector management.

Africa's transport sector has an important role to play in achieving this ambitious agenda.

### ROAD TRANSPORT

Road transport is the most dominant mode of motorised transport in Africa. The road surfaces, however, are subject to weather elements and deteriorate very easily, given that only a small proportion are paved. Maintenance of the road network is inadequate, and when done often inefficient. Transport costs are relatively high, perhaps the highest in the world: they account for 30 per cent of the total value of exports, compared with only 8.6 per cent for other developing regions of the world, according to the UN Economic Commission for Africa (*Africa Review Report on Transport*, October 2009). The poor transport connections with the rest of the world, as well as underdevelopment of systems and procedures for trade facilitation, leads to African countries, with the notable exception of South Africa, scoring badly on the global logistics performance index.

While road density in cities is low, traffic congestion is a common problem with public transport provided largely by the informal sector. Road safety is also an issue, with road crashes estimated by the UNECA report as killing over 225,000 people yearly – about one fifth of total fatalities from road crashes worldwide.

This poor picture of Africa's transport sector is largely the result of the absence of sector-wide

transport policy, weak institutions and inadequate institutional linkages. Data for decision-making is hard to come by, leaving decisions based on partial analysis, mainly focused on the needs of the 'formal' part of the network, and less on informal parts. There has been an emphasis on the 'hard' (infrastructure) side at the expense of 'soft' (policies, institutions, systems) side. The weakest links in the transport chain (rural or urban) are those used by the poor and have the highest unit cost; and the poor are further disadvantaged by the price of access and the cost of lack of access. Existing approaches are not sufficiently pro-poor, but there are signs that the need to improve this situation has been recognised.

## The focus of transport's role needs to be on increased action to reduce transaction costs and facilitate trade flows.

While these issues suggest that the present condition of Africa's transport sector is a constraint on growth, the sector clearly has a positive role in achieving the projected growth. The focus of transport's role needs to be on increased action to reduce transaction costs and facilitate trade flows. This implies development of regional transport corridors and implementation of trade facilitation measures. Economic players need to be allowed to respond to opportunities; the business environment must be



#### NIGERIA'S GROWING URBAN CHALLENGE: THE TRANSPORT DIMENSION

- Rapid spatial and population growth, the latter mainly from low income earners
- Travel demand growth rate at least equal to rate of urbanisation (3–6%)
- Inadequate national awareness or response to emerging trends
- Absence of a clearly articulated detailed urban transport strategy
- Transport investment programmes ad hoc in nature and heavily biased towards capital investment
- Low cost recovery, threatening sustainability of investment.
- Inadequate coordination of traffic and land use actions linked to urban management
- Inadequate transport sector institutional framework and capacity at all tiers of government
- Inadequate coordination of the planning for, the management of, and regulation/enforcement of demand and supply of transport facilities and services.

“The transport sector needs to be better oriented towards enhancing human and social capital.”

improved through transparency, predictability, clear laws and regulations for tenders, and lowering the costs of inputs.

The transport sector needs to be better oriented towards enhancing human and social capital. Employment creation, in both transport and non-transport areas, is important, together with improving access to schools and health centres, and reducing isolation, particularly of the rural population. Improving environmental conditions is linked to improved livelihoods, health and reduced vulnerability of the poor. Addressing each of these areas provide opportunities for firms and individuals to contribute to Africa's development.

#### THE GROWING URBAN DEVELOPMENT CHALLENGE

Africa is urbanising fast. In 2009, Africa had a total population of about 0.8 billion of which close to 40 per cent lived in urban areas. With an annual growth rate of around 4 per cent, it is projected that by 2050 about 60 per cent of Africans will live in urban areas. Most of the urban growth is taking place in slums, where about 72 per cent of existing urban dwellers live. There will be more megacities; Lagos in Nigeria is leading the way with a projected population of 17–20 million by 2015. Kinshasa is forecast to have a population of about 13 million by 2020. Many other cities are not far behind, with the populations of Luanda, Dar es Salaam, Nairobi, Abidjan, Kano and Addis Ababa increasing by over one million each by 2020. Nigeria's growing urban challenge is representative of what can be found in most of Africa, the difference perhaps being only in intensity.

All over the world, urban areas are centres of economic development and wealth creation. It is not uncommon for such centres to

“This requires more emphasis on urban development and management with the aim to identify and implement appropriate policies on a wide range of issues to promote the well-being of citizens.”

be home to between 60 – 70 per cent of the national economy. More often than not, they have been creators of wealth and economic opportunities. Existing trends show signs that this may not be the case in Africa, with urbanisation coming largely from the rural poor coming to cities that are not creating the needed economic opportunities to absorb the newcomers. This requires more emphasis on urban development and management with the aim to identify and implement appropriate policies on a wide range of issues to promote the well-being of citizens. Transport is just one of the areas where such policies are required, but it is a very important tool in achieving desired urban development goals. Unfortunately, historical and present trends suggest that the sector is more a constraint on rather than a facilitator of urban development. Largely responsible for this is the predominance of a traffic development functional approach to transport in which the focus has been on the provision of infrastructure, in the absence of policies and actions aimed at



Figure 1. Aerial photograph of an urban area in Burkina Faso. Source: Bukina Faso Second Urban Project, World Bank

meeting well articulated urban development goals. Unfortunately, such urban development goals have been absent in most African cities, leading to a chicken and egg situation.

With increasing urbanisation, transport sector actions needed to ensuring good urban growth need to focus on:

- Contributing to food security in order to reduce food imports, increase discretionary income among the rural poor and promote political stability. This implies interdependence between urban and rural development, needing explicit recognition in investment decisions.
- Cost effectiveness: promoting affordability to government/ users – the scale of the required investment in the sector and the low economic base of most African countries requires that they be judicious users of available resources with appropriate cost recovery mechanisms in place.
- Providing good international linkages: an effective supply chain helps industry be more efficient and competitive.
- Availability: in quantity (missing links provided) and quality (timely maintenance).
- Promoting industrialisation, technologically appropriate so as to provide opportunities for the participation of local industries, old and new.
- Openness, coupled with a stable policy and regulatory environment.
- Most importantly, pursuing a multi-sector approach, maximising opportunities for co-benefits.

Expanding on the latter point, the picture in Figure 1 is from Bukina Faso. The right-hand side shows a slum area typical of most of the urban landscape of Africa. It is difficult to imagine how required urban services, including urban public transport, can be efficiently and effectively provided. On the left is a more orderly urban structure within

Figure 2

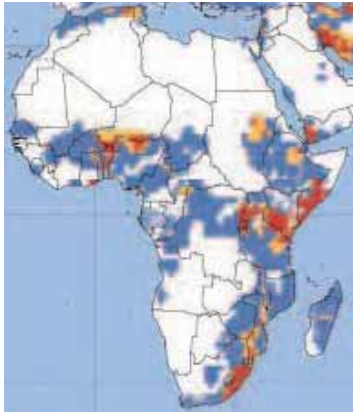


Figure 3



Figures 2 and 3. Distribution of flood hazard areas and trans-African highways

“Africa’s major cities and the strategic regional road transport corridors are located along Africa’s coastline, where floods are predicted to be more frequent and severe.”

which an efficient and effective public transport system could be provided, as well as other urban services. Getting from the right to the left is not the task of just one discipline. And in that task, improving energy efficiency could turn out to be the key objective function in many places.

### THE CLIMATE CHANGE THREAT

Climate change is a real and present danger for Africa. As seen from the Figures 2 and 3, Africa’s major cities and the strategic regional road transport corridors are located along Africa’s coastline, where floods are predicted to be more frequent and severe. Each

of the affected countries and cities need to develop strategies and action plans for coping with this danger. As witnessed in Mozambique, occurrence of such hazards can wipe out in short time the hard-won gains of many years’ hard work.

### TURNING CHALLENGES TO OPPORTUNITIES

Africa’s transport faces problems and key challenges. Each of these challenges need to be seen as opportunities, for it is in removing them that the transport sector will be able to make its vital contribution to realising Africa’s development potential.

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**The World Bank** is a source of financial and technical assistance to developing countries around the world and has provided support for billions of dollars of investments in infrastructure projects over the last 40 years. The World Bank Group consists of five organisations: the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA), and the International Centre for Settlement of Investment Disputes (ICSID).

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# METRO BUS SERVICES & ABUJA CITY TRANSPORT SERVICE PLAN



Metro bus services states how important it is to introduce and improve a transportation system in a city that is expanding daily and one in which many of the inhabitants are lacking basic access to transportation, in order to keep bus transit an attractive option for the public.

Public transportation provides people with mobility and access to employment, community resources, medical care, and recreational opportunities. It benefits those who choose to ride, as well as those who have no other choice.

The incorporation of public transportation options and considerations into broader economic and land use planning can help a community expand business opportunities, reduce sprawl and create a sense of community through oriented development. By creating a centre for public activities, development contributes to a sense of community and can enhance neighbourhood safety and security. For these reasons, areas with good public transit systems are economically thriving communities that offer advantages to businesses and individuals choosing to work or live in them. In times of emergency, public transportation can also enable communities to action a safe and efficient evacuation plan. Public transportation also helps to reduce road congestion, travel time, air pollution and fuel consumption, all of which benefit both users and non-users alike.

The Abuja inner city bus system will be a highly integrated, multi-model transit network. The new grid pattern for bus services across the federal capital territory and its suburbs will provide excellent access for Abuja residents. Metro Bus Services is committed to continually working to improve the effectiveness of this transit network. Providing a quality accessible and affordable mass transport system will subsequently contribute to poverty reduction, improved

living standards, sustainable economic growth and also act as a pioneer for private and public investment partnerships in the transport sector.

The specific project development objective is twofold; firstly to improve mobility along prioritised corridors and secondly to promote a shift to more environmentally sustainable urban transport modes. It is important to keep in mind that 65-70 per cent of the Abuja population makes part of their trip by public transportation, as a survey in 2011 proved, over four million daily commuters travelled from point A to point B in the federal capital territory.

The *Abuja City Transport Service Plan* recognises that a good and effective bus service has many components. The first section of the plan outlines initiatives that have been implemented or are currently underway, and the second section presents proposed new initiatives as part of the city bus transit plan. Below are some key points as to why public and private partnerships are important to the project:

- Fill the resource gap in infrastructure delivery and operation
- Accelerate infrastructure provision
- Promote faster implementation of projects
- Engender reduced total project costs
- Better risk allocation between public and private sectors
- Improve and sustain incentives for private sector performance
- Engender accountability in fund utilisation
- Improve the overall quality of service
- Generate additional revenue for government
- Improve overall value for money for the entire economy
- Private sector is disciplined in translating strategic intent into actions



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# NEW LAND TRANSPORT TRENDS FOR AFRICA



**Ramón Cruz** of the **Africa Transport Policy Program** (SSATP) highlights some successful road transport projects that have emerged in the African continent in the last few years, and lays out the key challenges of capacity, institutional development and financing of transport infrastructure.

The world's urban population reached a majority by the year 2010. The proportion of inhabitants living in cities expands every year in developing countries. So far, many African states still maintain low rates of urbanisation (e.g. 18 per cent in Ethiopia) but it is estimated that the urban population will reach 50 per cent by the year 2030. As a consequence of the emergence of China as an economic superpower, an increase in demand for Africa's raw materials and new oil exploration in many parts of the continent, GDP is expected to grow, lifting many people out of poverty. An increase in GDP will only exacerbate this migratory trend, attracting many more to the urban centres and demanding better infrastructure for the movement of people and goods.

The challenge for Africa is to build the necessary infrastructure in a planned way to provide mobility options for a new generation of Africans to live in safe, healthy and more dynamic cities. This would maximise the benefits of economic growth and achieve the goals of poverty eradication and sustainable development. In order to do this, the right structures and institutions need to be set up to prevent the adverse results that could derive from rapid unplanned growth. The problem is institutional as much as physical.

## ROAD TRANSPORT IN CONTEXT

Road transport is the most dominant mode of motorised transport in Africa, accounting for 80 per cent of freight and

90 per cent of passenger traffic. The road-to-population ratio for all of Africa is 26 km per 10,000 inhabitants. Poor road surface conditions are still a critical issue: only a quarter of the total African road network is paved, and the remainder is subject to weather elements and deteriorates much too easily. Transport costs are relatively some of the highest in the world, accounting for 30 per cent of the total value of exports, compared with 8.6 per cent for all developing countries, according to UNECA.

Travel times spent in transiting African roads are among the highest in the world. The failure of state public transport systems has given way to the growth of the informal sector, usually populated by minibuses and taxis,

and recently motorcycles, which find it easier to navigate in roads perforated with potholes. Today, minibuses account for half the trips made in motorised transport. The informal nature of this sector prevents it from being regulated. As a result, the drivers are often inadequately trained, drive irresponsibly, or work long shifts, all contributing to safety problems and accidents.

Road safety is one of the biggest problems, since Africa has the highest number of road traffic accidents per capita in the world. Other problems created by the current situation are the exacerbation of social inequalities – the lower income classes often have to walk longer distances or are left in areas poorly served by transit. This makes it more difficult to access social services such as schools and hospitals, or participate in markets and industries that would improve their economic situation.

Lastly, pollution and health problems are starting to rise due to increasing traffic congestion, lax enforcement of regulations, and influx of substandard old and second-hand vehicles and technologies. Africa's demand for fossil fuels and energy will continue to rise, making the transport sector the fastest growing source of greenhouse gas emissions in the continent.

### A POSITIVE TREND

Some key achievements in the last few years point the way towards a positive emerging trend. Road maintenance has increased, and a majority of countries have established active road funds. According to our estimation nearly half of the main road network is in good condition, an increase of 100 per cent from half a decade ago. As a consequence, there is better access to services and markets. New bus rapid

transit (BRT) lines are being planned and a handful have already opened. About half of the small urban railway system is under concession agreements. And finally, some modest data collection efforts have begun. The following four examples point to a more positive way of tackling transport issues in Africa.

### BUS RAPID TRANSIT: REA VAYA IN SOUTH AFRICA AND LAGOS BRT-LITE

Thirty years after the first model of bus rapid transit was developed in Curitiba, some cities in Africa are starting to build up similar systems. These systems are known for being cost-effective, attractive, high-frequency corridors designed for high volumes with off-board fare collection, elevated stations, separated lanes, and environmentally friendly new buses with intelligent transport systems. Cities are attracted to this option because of its high-speed, reliable service; the equity dimension, since it serves all kinds of people; economic growth potential, especially to real estate; and its relatively low cost and ease of implementation and operation.

Lagos in Nigeria and Johannesburg in South Africa pioneered bus rapid transit (BRT) systems in Africa, with relative success so far. Each city is its country's largest and the most important economic engine. Lagos, with 15 million inhabitants, is at least twice as big as Johannesburg. Each city had a colonial legacy public transport system that collapsed, giving way to the informal inefficient fleet of private minibuses. After BRT, each city can claim that it has improved public transport speeds, reliability and customer satisfaction while increasing usage.

Lagos inaugurated its version of BRT on March 2008, under the strong leadership of the governor,

“Africa's demand for fossil fuels and energy will continue to rise, making the transport sector the fastest growing source of greenhouse gas emissions.”

with a very cost-effective ratio of US\$1.2 million per km. The still expanding 22 km system carries nearly 175,000 passengers per day. It has been quite successful and has strong rates of approval. Rea Vaya, opening in September 2009 in Johannesburg, runs completely in dedicated lanes and is expanding its original 25 km, built at a higher price of US\$14 million per km, but still relatively low when comparing it with the construction of highways or railways.

### LAGOS METROPOLITAN AREA TRANSPORT AUTHORITY – LAMATA

The creation in 2003 of the Lagos Metropolitan Area Transport Authority (LAMATA) was unprecedented in the continent. Its purpose is to coordinate transport policies, programmes and actions, and has been hailed as the preeminent transport authority in sub-Saharan Africa. Based on best practices from abroad, it is designed as a professional organisation with a board of directors comprising the private and public sectors, as well as union representatives. This board reports to the Governor, as opposed to the state Commissioner of Transport. Very importantly, LAMATA enjoys a level of independence because its revenues come from the Transport Trust

Fund, generated from user charges. It follows a five-year corporate and investment plan and is subject to an annual audited account, which helps to keep transparent operations. This kind of institution is very important in the creation of integrated plans for infrastructure development.

### DAKAR BUS RENEWAL SYSTEM

In Dakar over 75 per cent of the daily person trips are made on public transport. Of this, only 20 per cent are taken through the formal public transport operators, the public bus company, which is a descendant of the failed state-owned company and the suburban rail. The remaining 80 per cent of travelling is done using what is called ‘car rapide’ or the informal minibus sector, supplemented by illegal taxis. This service used to be cheap but suffered with bad quality and reliability.

In an effort to improve standards, the government created a programme by which it would finance minibus renewal, while at the same time formalising the relationship with the operators and professionalising the sector with specific routes and fares. It is a good example of how to use public sector finance to benefit private sector operators. The government also seized the opportunity to provide technical assistance and training of the operators and drivers. Environmentally, the programme also provided incentives to counteract air pollution by taking the obsolete buses out of circulation. The big success of the programme is not only in the renewal of the buses, but in the formalisation of a sector that in many places seems intractably informal. As a result, this scheme offers faster and more reliable service, predictability of fares and increased revenues for the operators.

### SOUTH AFRICA'S NATIONAL TRANSPORT ACT OF 2009

The whole African continent finds the transport sector difficult to regulate. However, South Africa's efforts to do so are practical and credible. The National Transport Act of 2009, is an extensive piece of legislation that provides a model for a framework for action at the national level. In summary the new act:

- Assigns clear roles and functions for national, provincial and municipal governments
- Institutionalises planning authorities and regulatory agencies
- Provides a good assessment of the problems of the current system
- Regulates the private sector and provides a structure for different type of service contracts and licences
- Indicates funding arrangements for land transport for both the public and private sector
- Provides transport planning for frameworks at the different levels of government, the integration of the system as well as freight transport.

Even though there have been problems with implementation of this legislation, this is a most welcome effort that could easily be emulated elsewhere in the region.

### THE CHALLENGE: INSTITUTIONAL CAPACITY DEVELOPMENT, STRATEGIC PLANNING AND PROJECT FINANCE

There are a series of problems stemming from the lack of human and institutional capacity across the board in most African countries. This lack of institutional capacity presents a roadblock to creating policies that would provide stronger incentives and mandates for integrated, multi-

disciplinary transport infrastructure in metropolitan regions. Efficient institutions that have adequate and realistic mandates and that are staffed with motivated and highly skilled human resources are essential in the development of safe, economically sustainable and environmentally responsible transport systems. To this end, it is necessary to create or strengthen national and regional schools, research programmes at universities, and centres of specialised training in order to address topics such as finance, engaging the private sector, assessment methodologies, development of national and regional mobility plans and implementation of regulatory and financial incentives, among others.

It is necessary to create or strengthen national and regional schools, research programmes at universities, and centres of specialised training.

Planning for long-term investment in infrastructure development requires special attention. The public sector must set the strategy, propose public policy, identify infrastructure projects, address the environmental consequences, set fares in order to address cost rise and equity at the same time, acquire the necessary land and rights of way, ensure development permission, and provide some necessary guarantees. In Africa,



entities that can coordinate and implement these tasks are either weak at best or often non-existent. The formation of coordinating agencies such as LAMATA is very important. Moreover it is important to provide these agencies with the legal mandate to perform these tasks and the capacity to enforce and implement this authority.

Despite efforts to allocate between 6–8 per cent of their GDP into infrastructure development, African countries still fall short of their needs in the transport sector. Maintenance costs of the existing transport network and its operations are even higher than that amount. The biggest challenge for transport infrastructure development is

to create funding mechanisms from local sources. Figuring out transport finance structures is key to providing independence for transport institutions.

To this end, more creative sources of finance should be discussed; for example, a variety of taxes or hypothecated resources within the transport sector. Some of the options for discussion are cross subsidies from car drivers (because public transport accessibility should be seen as a public good) and land value capture (where land markets are sufficiently formalised and predictable). Another source of permanent and predictable funding would be the establishment of congestion charges in urban centres, though it might be too early for Africa to adopt that idea. The private sector in Africa, as



It is important to provide these agencies with the legal mandate to perform these tasks and the capacity to enforce and implement this authority. ”

well as foreign private firms, can be relevant potential players in the urban transport sector in Africa. Private sector involvement in financing this kind of infrastructure, even if modest, has at least increased in the last few years. Public-private



partnerships (PPPs) have proved to be a good financing model in certain transport projects, achieving the objectives of improved services.

Given the inter-reliability of urban transport modes, it would be appropriate to treat them as an integrated system. Packaging a single strategy as a city's mobility plan is easy to explain to potential multilateral and bilateral donors, the private sector and to domestic political stakeholders and decision-makers. This might result in an easier way to go beyond the capital investments and to obtain gains that often do not get supported in these sources of funding, such as maintenance and operations. Part of this packaging has to be supported with solid data. Data collection is not only important to analyse and target intervention, but also to support proposals for international sources of funding. These sources of funding are important to match current government funds.

There are other sources of international funding that the urban transport sector in general has not been very proactive at tapping into. Climate finance is a good example that can often serve as a catalyst to gear investments in the right direction towards sustainability, even though it is not in the same order of magnitude as national or regional development banks type of funding (it provides millions as opposed to billions or trillions of dollars). The commitment by the eight biggest multilateral development banks announced at the Rio+20 Conference in 2012, of US\$175 billion for sustainable transport infrastructure, presents an important opportunity for Africa.

#### DEVELOPING A SUSTAINABLE TRANSPORT VISION

For the next few decades, urban migration, economic growth, globalisation and a changing

climate will continue to amplify the problems and challenges described previously. A critical issue for transport planners and policy-makers in the continent will be effectively developing and selling a compelling vision of sustainability, built on the foundation of a strong, multi-modal, resilient and low-carbon transport system.

The sub-Saharan Africa Transport Policy Program, hosted at the World Bank, together with the UN Center for Regional Development, are initiating a continent-wide dialogue on establishing a regional Environmentally Sustainable Transport Forum for Africa (EST Forum) in order to tackle the challenges described above. The EST Forum would bring together senior government officials, decision-makers and international experts to develop a collective understanding of the interaction between transport and the environment and target opportunities to develop resilient, low-carbon, sustainable policies to foster best practices and regional integration.

Based on experiences in Asia and Latin America, such a forum could become the engine of regional initiatives and a leading champion of sustainability. It can also be one of the very few opportunities not only of effective regional planning but also of intra-ministerial interaction since often ministries within a country might not interact as much with each other, especially when it comes to policy-making and planning. The EST could also convene activities oriented to foreign investors in Africa's transport infrastructure so that they too can understand and fully participate in shaping a vision of sustainable transport development.

Other such ideas are needed and

are certainly welcome.

**Ramon Cruz** works for the sub-Saharan Africa Transport Policy Program at the World Bank. In the past, he was the Sustainable Development Program Manager at the Institute for Transportation and Development Policy, Vice President for Energy and Environment at the Partnership for New York City (NYC), a business group and Senior Policy Analyst at the Environmental Defense Fund. He has been an adviser to the NYC government on energy and solid waste issues and helped develop the city's sustainability plan.

The **Africa Transport Policy Program** (SSATP), a joint initiative of the World Bank and the United Nations Economic Commission for Africa (UNECA) is now a broad international partnership to facilitate policy development and related capacity building in the transport sector in Africa. It comprises 38 countries, eight regional economic communities, public and private sector organisations, and international development agencies and organisations. Since its inception, SSATP has been recognized as the foremost transport policy development forum in Africa, bringing together key decision-makers, while developing networks of specialists (researchers, operators and consultants) in most transport related fields in Africa. SSATP is financed by development partners.

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# ESSENTIAL INVESTMENT IN RURAL TRANSPORT



**Peter Njenga**, Executive Director at **International Forum for Rural Transport and Development** reiterates the importance of integrated transport policy in achieving international development goals.

Investments in transport deliver a wide range of household, local and international development objectives. This paper highlights the importance of scaling up investments in transport for lagging rural areas in developing countries. Transport has a primary role in supporting the development of communities and society by enabling access to basic services and economic opportunities. This function is a building block for the strategic role of transport – that of promoting economic growth, expanding markets, enhancing territorial integration, widening the spheres of social and political interaction and promoting democracy and security.

This paper presents the need to work on these two interconnected functions of transport: enabling

basic mobility at the community level, which is essential for the development of rural areas, and creating a broad range of connectedness through economic relationships, cultural and political interaction and promoting the notion of global citizenship.

## **RURAL INFRASTRUCTURE: A PERSISTENT CHALLENGE**

Transport is a vital input in enabling the integration of rural areas into the economic and political mainstream.

Planning and delivering sufficient transport services in rural areas is a persistent challenge. Rural areas are typically characterised by low population densities and dispersed economic activities that do not always lend themselves to reasonable economies of scale.

Therefore, many rural areas are unable to achieve the economic rate of return threshold required by normative transport infrastructure investment programmes. Related to this, rural economies are often unable to support the operations of conventional, market driven transport services.

From an economic and political standpoint, the urban and inter-urban transport systems attract more policy attention. There is a good body of knowledge and tools to justify improvements of the urban and inter-urban transport systems and consequently, a substantial amount of transport sector investments are directed towards these systems. Until recently, rural transport systems were a research and policy blind spot. As a result, a common feature of many rural

Transport is severely disrupted by poor road conditions in southern Cameroun



areas in developing countries is that both the means of transport and the infrastructure are poorly developed.

Rural infrastructure conditions are usually inferior because of low prioritisation compared to the higher hierarchy of the road network. The problem is further exacerbated by the fact that rural transport services are assumed to be outside the domain of public policy. Based on the received wisdom that transport services are purely the responsibility of the private sector, little consideration is paid to the non-existence of the assumed market conditions to support affordable and reliable rural transport services.

### STRATEGIC INTERVENTION

A combination of policies and strategic interventions are needed to reduce constraints to access and mobility in rural areas.

The first is the principle of network completion up to the lowest levels of human settlements. Granted that it is an accepted public policy responsibility to develop transport infrastructure, there is need to embrace a wider range of non-economic criteria if the many rural tracks, trails and bridges that serve

as a vital link between households, villages, and the outlying regions are to attract investment resources. In 2005, the World Bank introduced the Rural Access Indicator (RAI), which is now being applied by many developing countries within the Commonwealth as a standard for rural access planning. The RAI measures the percentage of the population that lives within 2km of an all weather road. The target established by the RAI is to have 100 per cent of the population within 2km of an all weather road. Despite its usefulness, the index obscures a number of potential difficulties. Firstly, it fails to capture typical village level infrastructural bottlenecks such as broken footbridges, treacherous terrain etc, that may impede access to an all weather road. Secondly, and more significantly, it assumes existence of reliable, affordable and appropriate transport services along the all weather road.

The second necessary intervention is policy support for the development of appropriate rural transport services. Nonexistent, unaffordable or unreliable transport services are an impediment to the delivery of and access to necessary economic and social services. There

is need to have a policy instrument to determine the appropriate types and standards of transport services needed for a rural area to meet certain basic needs. Such an instrument can be in the form of a Rural Transport Service Indicator, e.g. [www.ruraltransport.info/RTSi/index.php](http://www.ruraltransport.info/RTSi/index.php). It would help assess the performance of the various types of transport services operating in rural areas, ranging from bicycles and motorcycles and three-wheelers to the motorised vehicles providing freight and passenger transport services.

### TRANSPORT AND DEVELOPMENT GOALS

The imperative to reduce poverty and advance progress towards the achievement of Millennium Development Goals (MDGs) compels the inclusion of social equity as an equally important underpin for transport investments. This carries the notion of a rights based approach to basic access. It encapsulates the view that without basic access, it is difficult to secure some of the core obligations of public policy such as ensuring security, social cohesion and access to essential services such as health, education and markets.

MDGs have served as a common framework for global action and cooperation on development since 2000. Despite the pervasive influence of transport on the efficiency and effectiveness of other sectors to deliver on their objectives, its contribution to economic growth and its significance in terms of government and donor spending, the MDGs make scant reference to its importance in the development process.

With just a little more than two years left to the agreed timeframe for the achievement of MDGs, discussions are already underway to create a new vision and targets for a new global development framework. The theme of sustainable development is emerging as the anchor vision around which key targets are being debated. Sustainable development embraces environmental, economic and social patterns of development as well as issues of inter-generational equity. Ongoing discussions point to a degree of consensus on the strategic pillars of the post MDG sustainable development framework, and unsurprisingly, many of the issues are linked to the current MDGs especially poverty reduction, infant and maternal mortality, gender empowerment and food security. It also seeks to have a more holistic view of development outcomes, with a focus on some generic platforms such as:

- Inclusive social development
- Inclusive economic development
- Environmental sustainability
- Peace and security.

At the core of the emerging post MDG issues such as inclusive growth, equitable development, peace and food security, is the unarticulated role of transport

and its interaction with other infrastructure sectors such as information communication technologies (ICTs) in creating interconnected, interdependent and integrated communities.

“Sustainable development is emerging as the anchor vision around which key targets are being debated.”

The generic platforms of inclusive and equitable development link well with the role of transport as a catalyst for social, economic and spatial integration. The MDGs and the likely post MDGs are intrinsically linked to the primary role of transport in enabling access to goods, services and opportunities that help build community livelihoods and the strategic function of creating a broad range of ‘connectedness’ through economic interdependence, cultural interaction and political relationships.

### LINKING TRANSPORT AND ICTS

ICTs are playing an important role in complementing the transport function in developing countries. There is growing potential to combine ICT solutions and transport in the improvement of the social, human and physical capital in rural areas. They can enhance social capital by increasing access to social networks; they can also help build financial capital by allowing real time information on say, agricultural market prices, which can then be synchronised with provision of timely transport

services to enhance efficiency and profitability. Adoption and innovations in the use of ICTs provide an opportunity to develop new platforms on rural access and service delivery in a variety of sectors, with immediate opportunities in agriculture, health, education and small business development.

Every country needs a transport system that responds to the need for basic access while creating strategic linkages that advance economic development and social progress. A core message is that investments in rural transport facilitates delivery and access to a wide range of services that are important in meeting local and international development objectives.

**Peter Njenga** is the Executive Director of IFRTD, based in Nairobi, Kenya. He holds an advanced degree in urban and regional planning, specialising in rural transport in developing countries. He has experience of working in Africa, Asia and parts of Latin America.

The **International Forum for Rural Transport and Development** (IFRTD) is a global network of individuals and organisations working together towards improved access, mobility and economic opportunity for communities in developing countries. IFRTD membership spans Africa, Asia and Latin America.

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# FERMA - KEEPING NIGERIA MOVING



**Engr Gabriel C Amuchi, MD/CEO of Nigeria's Federal Roads Maintenance Agency (FERMA), outlines the accomplishments of the Agency and the opportunities for future investment.**

Nigeria the most populous country in Africa has a total of 160 million people on a land area of 911,000 sq km. The country stretches from the Atlantic Ocean in the south to the Sahara Desert in the north, and lies between longitudes 4° and 15°. There are two seasons – wet and dry – and the climate varies from equatorial in the south, tropical in the middle belt and arid in the north. The overall distance from the north to south is approximately 1,050 km, with an average of 1,200 km from east to west. The road networks are planned along the north to south and east to west grids, to link major seaports in the south, airports, busy cities and major economic centres.

Currently a total of 194,000 km of roads provide service to road users and comprise rural (local government), state and federal roads. Some of the major north–south and east–west routes are shown in the map below.

## FERMA: PAVING THE WAY FORWARD

Nigeria has the largest road network in West Africa and the second largest south of the Sahara. Nevertheless, transport in Nigeria faces a substantial challenge in bringing the transport system up to some level of international standards. Fortunately, since 2002, an institution was tasked with the maintenance of the country's over 34,000 km network of national roads. The Federal Roads Maintenance Agency (FERMA),

which was established when over 75 per cent of the federal roads network were in a terrible state of serviceability. In spite of the challenges the Agency inherited and the successes it has recorded to date, there is still a long way to go to achieve its vision for the federal road network. This includes bringing all existing roads up to an optimal level of functionality. Increasing serviceability is aimed at achieving Nigeria's Vision 20:2020 – an important target for Nigeria to become one of the top 20 economies in the world by the year 2020.

FERMA, although established to monitor and maintain the federal road network, has expanded the scope of its operations since the Agency's creation in 2002 to be able to cope with existing needs:

- It has designed a special repairs and pavement strengthening (overlay) programme to accelerate the recovery of roads that are in a fair state.
- Apart from vigorously pursuing road repairs and recovery programmes through the traditional process of direct intervention and general maintenance by contracts, a key policy direction of the Agency since September 2011 is to implement a maintenance programme that will put in place a Preventive Maintenance Regime.

This encompasses:

- A sustained surveillance

programme on federal highways to report, amongst others, flash points, developing failures, road abuses and control, and required attention on roads and bridges.

- A routine maintenance programme to ensure sustained and continuous maintenance works along critical federal roads in fair condition, including a sustained aggressive zero pothole programme along all economically viable roads.

The core objectives of this maintenance approach include:

- Ensuring that repaired and rehabilitated roads and those in good condition are sustained, improved upon and prevented from degenerating into poor or bad condition
- Making lasting improvement on the roads while at the same time averting a downward trend in network condition
- Maintaining the network in a safe condition to meet the needs of users and to minimise or fully eradicate the risk of accidents occurring due to surface defects and failures.

In order to achieve the above objectives, the Agency's capacity has been tremendously improved by:

- The acquisition and use of state of the art all in one road maintenance equipment such as Bergkamp FP5 pothole patchers
- The massive production and distribution of cold asphalt at all FERMA field offices for

proactive and prompt road repair intervention on all federal roads

- The commissioning of 80 TPH asphalt plants to ease access to asphaltic concrete
- Managing area contracts and output and performance-based road maintenance contracts (OPRC) are being introduced to ensure best value for tax payers in the road sub-sector.

## INVESTMENT OPPORTUNITIES AND PARTNERSHIPS

FERMA's road recovery, strengthening and preventive road maintenance programme has already created concessionary opportunities for private sector involvement. The Agency has also initiated various other programmes that include bridge maintenance, toll stops, and even solar-powered streetlights. Through these initiatives and the Agency's core activities which include road maintenance and monitoring of maintenance contracts and direct labour works, FERMA is creating business opportunities for potential partners. Strategies such as these are aimed at moving Nigeria towards realising its goal for Vision 20:2020 and promoting the Transformation Agenda. Considering that an estimated 80 per cent of the nation's transport and 70 per cent of the nation's socio-economic activities are carried out along the road networks, it is imperative that the

roads are adequately maintained and improvement works sustained.

The amount of investment necessary to bring the nation's road network up to acceptable standard, considering that some estimates put annual funding requirements for maintaining federal roads at about US\$1.0 billion, cannot be funded by the government alone. There is therefore the need for effective private sector participation. As high capital spending is required to address existing huge rehabilitation and maintenance backlogs, FERMA has therefore considered:

1. The public-private partnership (PPP) business model for sustainable maintenance of federal roads. The regulatory framework has been sufficiently developed by the Infrastructure Concession Regulatory

Commission (ICRC) under the Presidency of which the Agency is complying.

2. FERMA's Maintain Operate Transfer (MOT) concession, Highway User Tax (HUT) and International Vehicle Transit Charge (IVTC), and development and management of trailer parks are investment opportunities.

All these programmes present opportunities to prospective investors and are designed as rolling programmes. For more information please visit [www.ferma.gov.ng](http://www.ferma.gov.ng).

Finally, we seize this opportunity to invite all serious and interested investors in the road sub-sector to consider and accept our invitation to try it out in Nigeria. You will not regret that choice.

Federal Roads Maintenance Agency, (Establishment Act 2002), is the only statutory Agency vested with the responsibility of monitoring and maintaining all Federal roads in Nigeria.

The Board and Management are fully committed to repositioning FERMA to further propel economic growth in Nigeria.

The network of roads has a total length of 34,200 km with on-going maintenance, special repairs and pavement strengthening projects nationwide. FERMA is currently processing concession opportunities in road maintenance, trailer parks development and management, and outsourcing of revenue generation projects.

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163 Aminu Kano Crescent  
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Few examples of:  
**North – South Roads**  
(i) Lagos - Ilorin - Sokoto  
(ii) Calabar - Jalingo - Maiduguri  
**East – West Roads**  
(i) Lagos - Benin - Port Harcourt  
(ii) Katsina - Kano - Maiduguri

# RAILWAY INFRASTRUCTURE IN SUB-SAHARAN AFRICA



International railway policy consultant and former World Bank railways adviser **Louis S. Thompson**, principal of **Thompson, Galenson and Associates** outlines railway infrastructure challenges in sub-Saharan Africa and the potential for domestic and foreign investment.

Sub-Saharan Africa (SSA) is a sub-continent of enormous distances. Though the SSA region remains one of the world's poorest and least developed areas, it has long produced the types of agricultural commodities and mineral ores that would normally have mandated adequate rail transport. Indeed, the early economic development of the area was based on foreign (mostly colonial) investment in and management of railways, which were constructed to move the region's commodities to ports for export to developed economies. As in Latin America, the colonial era railways played a major role in the economies of the countries they served.

As the colonial era ended, the SSA railways entered a long period of fiscal and physical decline

caused largely by instability in the economies they served and the inability of their new government owners to provide adequate finance or management. Linked to this problem was the fact that most African railways were at inception lightly and cheaply constructed and political fragmentation in the SSA region created barriers at borders. These barriers deprived many of the SSA railways of the length of haul that would have permitted them to compete more effectively with other modes. In addition, the railways' chief freight competitor, trucking, tended to function somewhat better than railways in the chaotic transport competitive markets in SSA, even though the condition of the region's highways was not much better than the railways.

The eventual result by the end of the 1980s, again much like that of Latin America, was a rail network that was making financial losses, poorly maintained, inefficient in its use of capital and labour and ineffective at serving its customers. Passenger traffic was for the most part long-gone and freight traffic was heavily dependent on basic mineral flows within one country, or on mandated traffic from other public enterprises. In fact, the network actually constituted a net drain on the national economies. This has been particularly unfortunate for the area because many of the countries are landlocked and therefore heavily dependent on transport connections through other countries. Moreover, inefficient

Figure 1. Overview of the SSA rail network

Italic indicates number estimated from closest available year.

\* All meter or Cape gauge except Gabon

\*\* ton-km/(ton-km+Pass-Km)

	Route Km	Passenger-Km (000,000)	Ton-Km 1980 (000,000)	Ton-Km 2008 (000,000)	Percent freight **	Traffic Density (000 of TU per Km)
Botswana	888		600	674	100.0	759.0
Cameroun	1006		578	978	100.0	942.2
Congo-CFCO	795	135	500	352	72.3	612.6
Cote D'Ivoire/Burkina Faso	1245	181	602	800	81.5	788.0
Gabon	731	92	25	2485	96.4	3525.3
Ghana	1300	85	119	200	70.2	219.2
Kenya	2634	288	2281	1400	82.9	640.9
Madagascar	854		100	109	100.0	146.8
Malawi	710	19	234	51	72.6	98.9
Mali	734	204	132	200	49.5	550.4
Mozambique (Beira)	725		700	695		9586
Namibia	2382	49	1500	1000	95.4	440.2
Nigeria	3557	363	822	77	17.5	123.7
Senegal	906	138	307	300	68.5	483.4
South Africa	20,247	991	99,556	113,341	99.1	483.4
Sudan	5478	40	1970	766	95.0	5646.9
Swaziland	301		300	384		1275.7
Tanzania	2722	433	700	500	53.6	3428
TAZARA	1860	518	1106	500	49.1	547.5
Uganda	259		90	200	100.0	772.2
DR Congo (NWCC)	3641	140	1727	400	74.1	148.3
Zambia	1273	186	1386	600	763	617.4
Zimbabwe	2759	583	6864	1580	73.0	784.0
TOTAL	56,546	4445	122,199	127,683	966	2336.6

transport, including rail, has been a heavy drag on all parts of the SSA economies.

### ATTEMPTING AN OVERVIEW OF SSA RAILWAYS

It is difficult to provide a complete or accurate description of the SSA rail network, as there are no complete datasets and where information does exist, it is often questionable. The table in figure 1 is provided to give a general overview, but many of the numbers are approximate or estimated and the information should only be

used to assess the overall picture.

A number of conclusions emerge from the table:

1. South Africa is dominant. While the South African railway (Transnet Freight Rail, formerly called Spoornet) represents just over one-third of the line-km in the SSA area, it carries nearly 90 per cent of the freight traffic. This suggests two categories of railways – South Africa and the rest.
2. Essentially all of the SSA railways are meter or Cape

gauge (3'6"/1067mm). While Transnet Freight Rail has two lines (Saldanha carrying export iron ore, and Richards Bay carrying export coal) that operate at world traffic density levels, most meter and Cape gauge railways were originally built for light density operation in relatively difficult terrain. Most permit only very light axle loading and as a result, inherently have higher costs than more sturdily constructed railways. One result of the low line





capacity is that the SSA railways operate at traffic densities that would constitute minor branch line economics for most developed railways. Only South Africa and Gabon operate much above one million traffic units per line-km per year whereas EU railways operate at levels of four million or greater. Unfortunately, traffic density is one of the most important determinants of rail viability, so SSA railways face a real challenge in reaching viability.

3. A high percentage of the traffic (60–100 per cent) carried by SSA railways is freight because low speeds and poor service along with better road transport have driven away passengers. More significantly, freight traffic has been at best relatively stagnant and has actually decreased for a number of countries, again because of poor service and growing competition.
4. With the exception of South Africa, most SSA railways are quite small. For example, almost all carry less freight traffic than say the railway of Slovenia, so they are all small by European standards.

South Africa's railway is distinct. Transnet Freight Rail's 20,000km of line make it larger than all but SNCF and DB in the EU. Transnet Freight Rail constitutes a true national rail system carrying general commodities as well as mining and industrial commodities. Transnet Freight Rail has several electrified lines and operates at a technical and effectiveness level roughly comparable to that of many developed railways. The averages are a little misleading though: the Sishen to Saldanha and Ermelo to Richard's Bay lines carry about 60 per cent of Transnet Freight Rail's ton per km on only about 7 per cent of its line-km; much of the rest of the system is lightly used and of questionable financial sustainability. In addition, all of the apparent SSA freight traffic growth between 1980 and 2008, is attributable to Spoornet and Transnet Freight Rail. When the South African freight traffic growth is subtracted from the rest of the SSA system, rail freight traffic outside South Africa actually decreased between 1980 and 2008.

Overall, here is the World Bank's conclusion in *World Bank 2010*, page 229:

- Rail networks in Africa are

One result of the low line capacity is that the SSA railways operate at traffic densities that would constitute minor branch line economics for most developed railways.

disconnected, and many are in poor condition

- Some networks have closed and many others are in relatively poor condition
- As long as the railways are government operated, bureaucratic constraints and lack of commercial incentives will prevent them from competing successfully

The SSA government responses to the railway challenge have generally fallen into one of three types; South African restructuring, concessioning with rehabilitation and inaction.



Source: Henry Posner, Railroad Development Corporation

### CONCESSIONING SSA'S FREIGHT RAILWAYS

The South Africa government created a large holding company, Transnet, which originally owned Spoornet, all the ports and harbours, the national pipeline company and the national airline. In an initial step, Spoornet's passenger services and the airline were transferred to other agencies, which lifted the support burden from the freight railway. Subsequently Transnet has absorbed its component parts so that it is difficult to distinguish the performance of Transnet Freight Rail from the rest of Transnet. The government has conducted a number of restructuring studies of the transport sector, including the railway, and has proposed a large program of infrastructure investment, but detailed plans for the future of freight railways in South Africa are not yet available.

There has been a significant move to concession SSA's freight railways. The following list is by no means exhaustive:

- Sitarail from Cote d'Ivoire to Burkina Faso, initiated in 1995, was quite positive until the disruption caused by civil conflict in Cote d'Ivoire. It has since recovered
- The Togo railway was

conceded to CANAC in 1995. The concession was transferred to a joint venture of West African Cement and RITES of India in 2002

- The railway of Zaire (now Democratic Republic of Congo) was concessioned (Sizarail) in 1995, but was terminated in 1997 due to civil conflict. It has been re-concessioned as SNCC
- The Zimbabwe railway was partly concessioned in 1997, but the concession is not now in force.
- Camrail was concessioned from the old Cain Meroon Railway in 1999, as was the Transgabonaise railway concession
- The Central East African Railway was created from the old Malawi Railway in 1999. It now serves traffic in Malawi and Mozambique (Nacala) and is controlled by Mozambican investors
- Transrail (Senegal-Mali) was formed in 2003, as were Madagascar (Madarail) and the National Railway of Zambia (RSZ). RSZ was renationalised in 2012)
- The Beira and Nacala railways in Mozambique were

conceded in 2005

- The railways of Kenya and Uganda were concessioned in 2006 (Rift Valley)
- Tanzania Railways Corp was concessioned in 2007, but the concession was renationalised in 2010

Success has had to be measured by covering operating costs and some portion of equipment and track maintenance costs.

The concessioning process has certainly not been trouble free. In part, this is because writing and implementing successful concession agreements puts a large burden on governments that have little experience in doing so. It could also be that at least some of the concessionaires may have had objectives other than rail operation in mind. In addition, as figure 1 suggests, many of the SSA railways

are so small and lightly used that there may be no sustainable role for them whether concessioned or not. There were also cases where civil conflict made operations impossible and, of course, weak government and corruption in the SSA economies make all enterprise management a challenge.

Looking at the future of railways in the region, there are several reasons for at least measured optimism.

With this acknowledged, many of the concessions have survived and have done better than the government operators before them. This appears to have been particularly true of concessions that had solid bulk commodities traffic in a period of strong world markets and a combination of government rehabilitation and fair regulatory policy supporting the private operator. Even so, success has had to be measured by covering operating costs and some portion of equipment and track maintenance costs. There have been few if any cases where the concessionaire has been able to engage in any significant degree of asset rehabilitation or major investment, though there are proposals to build entirely new mining railways where traffic will support it.

It is significant, though, that private investment in concessions has almost always been accompanied by a programme of policy reform, often financed by an international development bank. In some cases, development finance has included

both loans to the government for asset rehabilitation and investment in the private concession.

The remaining cases of purely public operation (Democratic Republic of the Congo, Zimbabwe, Namibia) are not encouraging. The future of these railways may well be in question if some form of restructuring or concessioning is not attempted.

### THE FUTURE: INVESTING IN RAILWAYS & INFRASTRUCTURE

In looking at the future of railways in the region, there are several reasons for at least measured optimism.

First, subject to forces in the world economy that are uncontrollable and unpredictable, many of the SSA economies seem to have turned a corner toward more stable governance and economic development. If so, their railways should benefit accordingly, though many of the benefits seem more likely to accrue to highways and air traffic than railways. There has also been some progress in reducing trade barriers and improving transport connections, though a number of problems remain. Perhaps most importantly, there is now a large body of railway reform experience available, replete with the lessons of success and failure. Countries wishing to pursue the process can find plenty of help and sources such as the Commonwealth Business Council, which can sponsor such assistance. In this regard, the role of Brazilian investors in the movement of coal from Mozambique is particularly interesting as the hard-earned lessons of concessioning and private operation of high-density railways in Brazil are now being transferred.

Aside from the private sector investing in concessions, the role of the government of China may be particularly significant. China has long had an interest in SSA railways, as evidenced by the

building, financing and operation of the Tanzania-Zambia (TAZARA) railway. More recently, driven by a determination to control supplies of basic materials, China has invested, or proposed to invest, in railway infrastructure in Ghana and Nigeria and there are said to be 25 or more current railway projects with potential Asian investors according to *The Economist*, Feb 16, 2013, pg 50-51. It remains to be seen whether the new Asian investments will be accompanied by requirements for restructuring or reform or whether they will focus on assets and political influence.

*Much of this article is based on the author's experience as the World Bank's Railways Adviser from 1987 to 2003. More recent data and experience are based on three excellent World Bank studies: 'Africa's Infrastructure, A Time for Transformation.' (see especially Chapter 11) 2010, and 'Off Track: Sub-Saharan African Railways,' 2009, and 'Africa Infrastructure Country Diagnostic, Railways in Sub-Saharan Africa', June 2009.*

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**Thompson, Galenson and Associates** was established in 2003 as an international railway policy consulting firm with experience in North America, Latin America, Asia and Europe.

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# MARITIME INFRASTRUCTURE CHALLENGES AND OPPORTUNITIES



**Samuel Kamé-Domguia**, convener of the **2050 AIM-Strategy Task Force**, examines the situation of Africa's ports and related transport facilities, and explains the role of the African Union's initiatives for the marine environment.

Maritime infrastructure is the collective term used to describe the installations and services that enable and facilitate mercantile marine activity. It covers in its ambit cost intensive elements such as ports, shipping and shipbuilding, as well as service providers. Africa's port facilities suffer from inadequate physical capacity, as well as administrative and transport challenges. In June 2011 the African Union (AU) formed a cross-department task force to develop a coherent and comprehensive plan known as the 2050 Africa's Integrated Maritime Strategy (2050 AIM-Strategy). The 2050 AIM-Strategy articulates an overarching multilayered African-driven long-term vision to address Africa's maritime challenges and opportunities.

There cannot be sustainable social development without peace and security, and without development and empowerment no sustainable peace will occur. Therefore, to further boost maritime viability in Africa and develop the 'blue economy', building on the security-socio-development nexus, the AU will establish a cross-sectoral Strategic Foresight Marine Task Force (SFM TF) to assess the broad spectrum of current marine activities, bearing in mind the future potential for wealth creation from sustainable development in the African maritime domain. The Task Force is examining how to make Africa's maritime industry more competitive for international and regional trade, and as a source of sustainable food supply and energy. This requires identifying sectors with the most

growth potential (such as ports, aquaculture, renewable energy, submarine telecommunications, tourism and marine biotechnology) as well as the sustainability and security of Africa's energy supply, not only considering hydrocarbons but also renewable marine resources which could further support economic development and sustainable job creation.

Africa's share in world trade stands at about 3 per cent on average, while intra-African trade averages around 10 per cent of Africa's total trade. Further, Africa's share of exports to the world has declined over the years – standing at an average of 2.5 per cent, a net decline from 10 per cent in the 1950s. In addition, Africa attracts only 2-3 per cent of global foreign direct investment, and contributes another

## Ports and related facilities must be planned on a regional basis, to avoid the costs of fragmentation and duplication of effort.

1 per cent to world GDP. It is imperative for Africa to transform its competitiveness and share of global and regional trade. To do so will necessitate overcoming the various barriers that stand in the way of productivity, trade performance and economic development. In this regard, enhancing access and exploitation capacity in the African marine environment provides substantial economic opportunities and potential for improvements, including supporting efforts to boost intra-African trade and the creation of the Continental Free Trade Area. Ports and related facilities must be planned on a regional basis, to avoid the costs of fragmentation and duplication of effort.

To further Africa's trade performance, the continent has to make its maritime transport industries (ship building, marine equipment and port industries) more competitive in both regional and global markets.

### THE PORT INFRASTRUCTURE

Ports are the largest infrastructure constituent of maritime business. Ports are home to many subsidiary industries, enterprises and providers of services. Among others, these include stevedores, road and rail freight forwarders, warehouse operators, container terminal operators, container repairers, customs agents, dock workers, ship's chandlers, bankers

and lawyers. Port infrastructure not only supports and stimulates the shipping industry but also shipbuilding, ship repairing and ship breaking; maritime machinery and equipment, dredging and the offshore industry, as well as fishing and aquaculture. Ports provide the link between land and the sea, thereby enabling the passage of trade.

To ensure a healthy state of trade, a port needs to be productive. The productivity of a port is measured in terms of a set of key performance indicators. In particular, the performance of a port is dependent upon the speed with which vessels and their cargo are turned around: the loading and unloading, and how soon the vessel can leave after entering the port. Included in this calculation is the duration that cargo stays in port prior to shipment, or after discharge. Although there has been an increase in productivity in the recent years, the performance of African ports compares unfavourably with the efficiency of other ports of the world. This is a challenge to the African blue economy, but also a source of opportunities.

Several African ports suffer from low capacity, particularly in terminal storage, maintenance; and dredging capability. Many ports are poorly equipped and uneconomically operated. Container handling rates fall well below international norms. Port charges for both containers and general cargo are substantially higher than in other regions. Security standards are still extremely variable. Maintenance dredging is often inadequate because of the reliance on ad hoc projects rather than long-term performance contracts. In addition, many ports have poor navigational aids.

Delays at ports are very costly. These are often caused by long processing and administration times,

and by poor handling in congested port areas, rather than by lack of basic quay capacity. In practical terms much can be achieved by simply improving performance. Many ports and industry players have realised that they need to reduce congestion and minimise delay. The main requirements are organisational. Many capacity constraints could be overcome simply by making the existing ports more efficient.

African shipping has been largely deregulated. However, many African countries are trapped in a vicious cycle of high tariffs that discourage traffic and further

### THE IMPORTANCE OF PORTS

- Ports are critical links in transport logistics.
- Ports are stimulators of economic growth.
- Port efficiency is one of the most important factors in trade facilitation.
- Ports work in a complex environment with many stakeholders.

### FACTORS THAT MAKE PORTS UNCOMPETITIVE

- Inadequate physical capacity and insufficient productivity
- Inadequate information technology systems
- Cumbersome and bureaucratic cargo clearing systems
- Shortage of adequate storage areas
- Clogged access ways to the port and saturated inland connections
- Inefficient intermodal cargo flow on network of rail and road transport
- Seasonal congestion for export commodities
- Administrative slow-downs and bottlenecks.

increase costs. Poor inland links and wasteful and costly port administration accentuate this problem. The lack of an integrated land distribution system, particularly for transit, impedes container traffic. Africa has been integrated into the global liner network through global players' acquisition of regional operators and replacement of direct calls by transshipments from elsewhere.

Africa has many small and medium-sized ports, with a low concentration by world standards. All three regions, eastern, western, and southern, claim to suffer from specific capacity problems. The proliferation of ports and the limitations on traffic volumes add to the high costs of shipping to Africa. Greater port efficiency and regional integration to provide better links between the port and its hinterland are the only solutions for small ports to increase traffic. Without achieving this, several maritime countries will continue to be served by feeder services (particularly in east Africa) and by regional liner services (in west Africa).

### INLAND DISTRIBUTION

Africa's maritime traffic has been growing rapidly across all cargo

types, although container traffic is highly unbalanced and faces major challenges because of the lack of efficient transport links back to the hinterland. The volume of container traffic passing through African ports is often far less than their handling capacities. Currently, inland waterways in the continent are insufficiently utilised, and in most cases poorly developed. The lack of an integrated land distribution system, particularly for transit traffic, impedes container traffic. Handling of dry and liquid bulk exports is making the most progress, with many port facilities privately owned and integrated in a comprehensive logistic system.

To supplement the ports, rivers and lakes could serve as an inexpensive, energy-efficient and environmentally friendly medium for transport and provide important prospects for penetrating landlocked countries. Further, improving the connectivity and access possibilities within and between African countries to internal and external market destinations would greatly strengthen the competitiveness of countries, regions and the continent.

There is an upper limit to optimal vessel size to be handled by ports, because of the low total volume of freight in and out of Africa. In fact, a tendency will exist to transship through a small number of African regional hubs with container facilities to distribute traffic along the coasts.

Liberalising the shipping market has already brought down deep-sea shipping costs; it should also facilitate the development of less costly feeder services for container shipping. As the major traders attract the global operators, they may also develop a niche market in African feeder services, re-establishing African ownership of shipping companies.

“Rivers and lakes could serve as an inexpensive, energy-efficient and environmentally friendly medium for transport and provide important prospects for penetrating landlocked countries.”

### SUPPORT FACILITIES

Concerning the facilitation of maritime trade, emphasis should be put on setting up support facilities for shippers, to include 'single window' documentation, logistics platforms, dry docks, warehouses and satellite tracking of containers.

In order to promote discussion among actors with maritime responsibilities, the AU has undertaken a full-scale maritime sector assessment that will lead to the activation of relevant reform programmes. The envisaged maritime sector reform will map and assess existing capabilities and gaps so as to improve cooperation, capacity building and coordination between all stakeholders, to enhance wealth creation in a safe and secure marine environment, across each of the six cross-cutting categories of activities in the maritime sector (commerce, transport, extractive industries, defence and security, tourism, and education and scientific research). Specifically the four building blocks for capacity building are:

- Software integration using design architecture such as that provided by MDA or C4ISR, compliance procedures, public participation, information sharing, environmental protection

#### KEY CHALLENGES FOR AFRICAN WATERWAY OPERATION

- Strengthening institutional capacity for management
- Harmonisation of policies, legislation and regulatory standards
- Pollution control and prevention
- Rehabilitation of waste water treatment facilities
- Pollution risk management and safety of navigation
- Community capacity building and participation.

- Maritime professional development, developing the recruitment process, leadership doctrine, training, pay and benefits, public support, professional relationships
- Maritime infrastructure (piers/quays and port facilities, dockyards/shipyards), command centres, aids to navigation and hydrography infrastructure and facilities, maintenance facilities, training facilities
- Maritime surveillance and response capabilities: legal authority, patrol vessels and operational equipment, command and control, operational procedures, sub-regional and cross-country interoperability.

## PUBLIC AND PRIVATE OWNERSHIP

The dominant port management model in Africa is still based on the public sector: the state enterprise owns the port infrastructure and undertakes all port operations. This model is beginning to change. Private participation in infrastructure (PPI) is a vital part of port development in today's liberalised trading environment. PPI projects help to provide the financial support and expertise that many ports need for their commercial and social objectives. And for the investor they can provide the opportunity to profit from rapid growth in international trade.

Port regulation is normally undertaken by a ministry of transport, rather than by a quasi-independent agency; thus, it tends to be highly politicised. Some countries are developing new port master plans, several with a focus on institutional reform.

## THE WAY FORWARD

The environmental needs for African ports and maritime

structures dictate that planning and implementing authorities need to;

- Update transport infrastructure and equipment
- Create a favourable legal and institutional one-stop environment
- Establish an independent regulatory body (southern Africa model)
- Develop value-added support activities (Djibouti model)
- Promote good governance and transparency in the tendering process for public-private partnerships
- Create political will with governments and port authorities for the public sector to withdraw gradually from operational and commercial services
- To eradicate corruption with legal instruments (Mauritius model).

The Ministers and Heads of Delegation participating in the Ministerial Segment of the 2nd Conference of African Ministers responsible for maritime-related affairs held in Addis Ababa in December 2012, adopted a declaration that supported the 2050 AIM-Strategy by recognising maritime challenges and opportunities, particularly in infrastructure. In the declaration the delegates therefore committed themselves to strengthen and sustain inter-agency collaboration at national levels, as well as enhanced cross-border and sub-regional cooperation.

The participants pledged to take all necessary steps to ensure the ratification by the AU member states of all relevant international instruments, and take full advantage of their provisions; and further to adopt the 2050 AIM-Strategy, the long-term vision to address Africa's maritime challenges and opportunities.

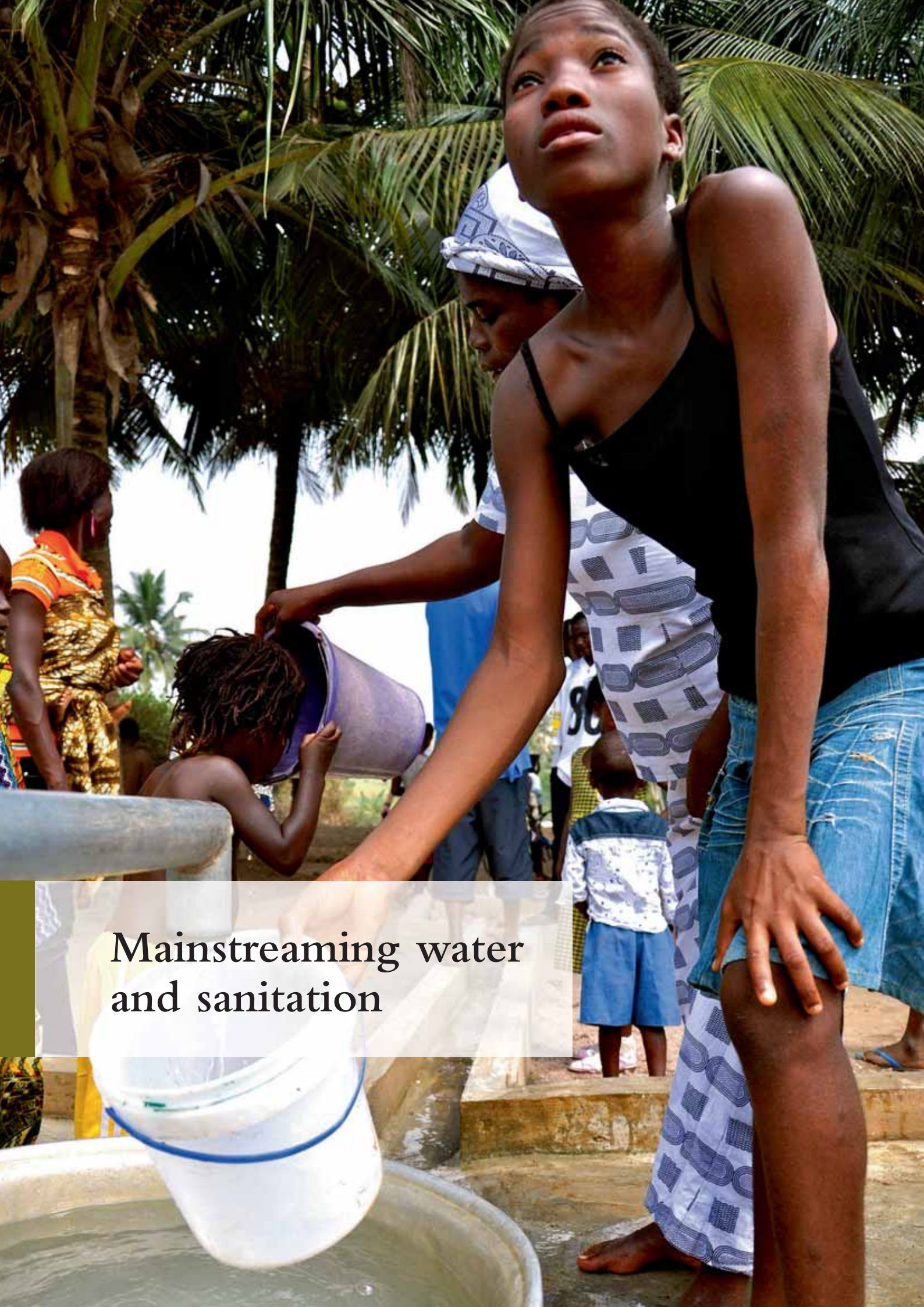
**Samuel Kamé-Domguia**, OCist, is a graduate of the French Naval Academy (Brest, France), Surface Warfare Officers School (Coronado, California, USA), Command and Staff College (Yaoundé, Cameroon), and currently finishing an Executive MBA program at Hult International Business School. He joined the African Union (AU) Commission in 2007, as Strategic Planner within the Strategic Cell of the AU's Darfur Integrated Task Force. Realising that oceans geostrategic challenges and opportunities were not addressed in the AU's Strategic Plan, he initiated the development of the 2050 Africa's Integrated Maritime Strategy (2050 AIM-Strategy).

## The 2050 AIM-Strategy Task

**Force**, which incorporates experts nominated by the regional economic communities, regional mechanisms and relevant specialised organs such as the Sea Power for Africa Symposium, is composed of representatives from the following departments and directorates at the African Union Commission: peace and security; economic affairs; human resources, science and technology; infrastructure and energy; political affairs; rural economy and agriculture; social affairs; gender; trade and industry; information and communication; administration and human resources management; office of legal counsel and strategic planning. When deemed necessary and appropriate, the 2050 AIM-Strategy Task Force may call upon any expert for his/her expertise.

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Mainstreaming water  
and sanitation



# WATER AND SANITATION IN AFRICA



Equal access to safe water and sanitation is at a global crisis point. Nobel Prize winner **Ellen Johnson Sirleaf**, the first female President in Africa and the continent's Goodwill Ambassador for Water and Sanitation, outlines the issues involved and points to the solutions desperately needed.

Fragile and finite, water is our most precious resource and it must be managed and protected. Ensuring the availability of water, utilising its productive potential, mitigating its destructive impacts, and equitably sharing access to it, are the most critical issues facing all the societies of the world.

When I took office as President of Liberia, we had to completely start again. My homeland had been beset by a vicious and unforgiving civil war that had lasted 14 years. After such a painfully drawn out period of violence and destruction, our infrastructure was decimated. There was a criminalised economy, dysfunctional institutions and no electricity grid. Our neighbourhoods were unlit and the roads were in complete

disarray. If you could find a school or a health centre, the chances are that the facilities were so sparse it could barely function. Worst of all was the absence of water. Communities were forced to drink from stagnant ponds and swamps, which resulted in water-borne diseases such as dysentery, diarrhoea and cholera. Drinking water, the most basic of human needs, should never be reduced to a life-threatening decision.

## POVERTY REDUCTION

One of the poverty reduction strategies that we immediately put into place was centred on governance and infrastructure. Worldwide, more children die from sanitation-related diseases than from malaria, AIDS and TB combined. Waterborne diseases

account for 1.8 million deaths annually, that's 5000 deaths per day. We know that the vast majority of these deaths could be prevented by investing in safe water supplies, decent toilet facilities and raising awareness of the need to improve hygiene practices. In Liberia we have made access to safe drinking water a priority under our Lift Liberia poverty reduction strategy. This fundamental approach is one of the imperatives of my administration. We projected that if the Liberian government improved access to safe drinking and sanitation, we could save tremendously on the cost of drugs and reduce patient hospitalisation. We finally restored pipe-borne water that had been lacking in the capital for two decades.



### IMPROVED SANITATION BOOSTS ECONOMY

If Africa eradicated water and sanitation poverty, we stand to gain an additional 5 per cent of its GDP. For every dollar invested in water and sanitation, we could yield up to four dollars back in economic terms. A particular failing of many countries is their view of safe sanitation as being a result of development, rather than the actual driver of poverty reduction and economic progress. There must be a change in perspective so that the need to address sanitation is understood as a key to boosting economic development. Effective water resource infrastructure and management hits two nails with one strike, in that it not only enhances economic growth, but helps drive back poverty too.

Global economic losses due to poor water and sanitation are costing US\$260 billion every year. More than 2.5 billion people worldwide live without adequate sanitation and almost 800 million people live without access to clean water. More

than a third of a billion of these people live in Africa. The water, sanitation and hygiene (WASH) sector cannot be overlooked or undervalued any longer. We are enduring a water and sanitation crisis that is holding back our continent's development. As the Goodwill Ambassador for Water and Sanitation in Africa, I hope my advocacy will encourage other African leaders to join together in tackling this critical issue.

### MILLENNIUM DEVELOPMENT GOALS

Established in the year 2000, after the Millennium Summit of the United Nations, The Millennium Development Goals (MDGs) are eight international development goals that all 193 United Nations member states and 23 international organisations agreed to achieve by the year 2015. The seventh goal aims to halve the proportion of people without sustainable access to safe drinking water and basic sanitation. I am pleased to say that in 2010 the target for drinking water was met five years early. Over two

“Worldwide, more children die from sanitation-related diseases than from malaria, AIDS and TB combined.”

billion people have gained access to improved water sources over the last two decades, making the drinking water target one of the first MDG targets to be accomplished. However, with less than three years remaining until the 2015 deadline, the figures for sanitation show that nearly every country in sub-Saharan Africa (SSA) is significantly off track.

The current number of people with improved sanitation in Africa needs to more than double to 615 million by 2015, but if the present trend continues, Africa, particularly SSA and its constituent countries, will miss the goal. It is the poorest

Effective water resource infrastructure and management hits two nails with one strike, in that it not only enhances economic growth, but helps drive back poverty too.

people who are most acutely bearing the brunt of this, as almost half of the 2.7 billion people with no access to improved sanitation live on less than two dollars a day. The MDGs continue to be a laudable and worthwhile mission – galvanising people from all over the world and inspiring them to work together to alleviate the suffering of the world’s poorest people – but when it comes to sanitation, not enough is being accomplished. We are not meeting the needs of those who need our collective help the most. According to the international charity WaterAid, if participating governments can meet their goal and halve the proportion of their population without sanitation by 2015, the lives of 400,000 children under the age of five will be saved around the world – with over 100,000 in Nigeria alone. We have to concede that we are not doing enough when presented with the fact that there are more people in the world today without access to sanitation, than there were in 1990.

#### SANITATION IMBALANCE

The average access across SSA to sanitation services sits at 61 per cent for water but just 30 per cent for sanitation. Spending on WASH is minimal compared to health and education and not enough aid gets

allocated to water and sanitation. At any one time, half of all hospital beds in developing countries are filled with people suffering from water-related diseases, the cause of a large portion of this is linked to poor sanitation conditions. We have to do more to address and reverse this trend.

#### PRESENT STATUS

Sub-Saharan Africa is the most severely affected region of Africa. Access to WASH is markedly less than in countries north of the Sahara. Unless there is a sudden spike in concerted efforts, nearly all countries in SSA will fall short of the MDG for access to improved sanitation. One of the most pressing issues is the battle to reduce the practice of open defecation in Africa. In many regions, the absence of a functioning toilet system leaves people without a choice, but open defecation causes an array of health issues and development hurdles. It’s a challenge that must be approached not only through providing facilities, but also by engendering cultural change that alters the behavioural habits of a population. We must encourage international aid and policymakers must focus on realistic targets of improving sanitation one step at a time. Nobody expects a transition from a traditional latrine to a sewage system connected by flush toilets overnight, but by progressing in stages we can achieve the ultimate objective of universal access for all.

#### OBSTACLES AND SOLUTION

The difficulties that stand in the way of real progress in the WASH sector are clear. Firstly, developing countries assign low priority to WASH national expenditure and the sector is vulnerable because the sustainability of services provided can be unpredictable. Off-target funding is another contributing

factor and more often than not, WASH aid volumes are insufficient to address the scale of need. In order to get on-track and on-target there must be direct investment in WASH where it is needed the most. The leadership in the sector needs to be supported and strengthened and international aid needs to be increased and focused, effectively putting the sustainability of services at centre stage and influencing the national government spending on WASH. Firm and conscientious political commitment is vital for cultivating a foreign aid-friendly environment and a stable macroeconomic climate.

Almost half of the 2.7 billion people with no access to improved sanitation live on less than two dollars a day.

#### CLIMATE CHANGE INFLUENCE

Each year brings new pressures on the WASH sector. The world’s growing population compounds problems but the most ominous and potentially catastrophic factor is climate change. With the effects of climate change being ever more apparent, the need for improved attention on water and sanitation is pressing. Due to increased global temperatures, the already dire problems are exacerbated. Whilst we in Africa must stockpile water for annual droughts, those in flood-prone areas such as Calcutta and Shanghai must gather medicines and recruit additional health staff to prevent and treat water borne diseases.



Across Africa, in the poorest countries, water may be delivered in decrepit metal pipes instead of flexible rubber or PVC ones that expand and contract according to temperature fluctuations. Makeshift sewage systems may be too small to remove waste effectively, causing fermentation and the release of toxic methane gas during high temperatures. With recurrent and extreme changes in climate, advance planning is imperative to help people to sustain their way of life and livelihoods. The relevant governments in Africa must realise that building water storage infrastructure is vital for providing the water needed for essential human activities and in adapting to climate change.

“Building water storage infrastructure is vital for providing the water needed for essential human activities and in adapting to climate change.”

Unless preventative efforts are urgently ramped up, the number of people vulnerable to flood disasters worldwide is expected to balloon to two billion by 2050 as a result of climate change, deforestation, rising sea levels and population growth. Innovation is needed not only to sustain the funds we receive and encourage more donors, but also to accurately direct the money to the areas where it is needed the most. Water is the most pivotal element in sustainable development. It is

of paramount importance that we position water at the core of the varied solutions proposed to address climate change. When water supply is sustainable and equally available to all, only then will people be afforded the right to dignity; only then will true socio-economic progress be made.

### THE FUTURE

There is still a chance to meet all of the millennium development goals. Even the mountainous task of raising sanitation levels high enough to hit the agreed levels is still possible. Just because something has not been done yet, doesn't mean it can't be. We must also look beyond the 2015 deadline and contribute to the formulation of a post-2015 framework for the development work of the United Nations. The UN Secretary-General will lead this process and should find continued support from all concerned.

If we are to make a difference, there has to be a collective effort on behalf of the governments in question, the donors, the international aid organisations and the charities and NGOs. As long as water and sanitation remain neglected, and for as long as water and sanitation poverty threaten lives and our development prospects, then we all fall short of our responsibilities and Africa will be prevented from achieving its true global potential.

The struggle for improved global water and sanitation conditions has never been more pertinent as the United Nations has launched the International Year of Water Cooperation at the UN Educational, Scientific and Cultural Organisation's (UNESCO) headquarters in Paris, France. The International Year will shine an extra light on the need to raise awareness and facilitate

action on water cooperation as it relates to sustainable and economic development, climate change and food security. Also this month, on March 22, we come together for World Water Day. The United Nations General Assembly designated March 22, 1993, as the first World Water Day and each year the event highlights a specific aspect of water. This year it will be water cooperation, in parallel support of the new UN's International Year.

My home country is like most other developing countries in that we aspire to outgrow the need for aid. We look forward to a day when our economy is strong enough to support our people without international donors. We hope for a day when our children no longer suffer from preventable diseases and when our people can rise above the level of mere existence and live with genuine opportunity. That day has not yet arrived, but with continued international aid, intelligent and committed policy from developing governments, and the dedication and resilience of the African people, we will get there.

**Ellen Johnson Sirleaf** is the 24th president of Liberia. First taking office in 2006, Sirleaf was re-elected and began her second term in 2012. She is the world's first elected black female president and Africa's first elected female head of state. Sirleaf is a Harvard-trained banker and joint winner of the 2011 Nobel Peace Prize, as well as an exemplary world leader.

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# BIWATER: MEETING AFRICA'S WATER NEEDS THROUGH FINANCING SOLUTIONS



Images left to right: A water treatment plant in Abuja with a capacity of 400 million litres a day, currently under construction; Clean, safe running water supply for the first time in a village near Tamale, Ghana – women and children are no longer required to walk vast distances daily for untreated drinking water.

Biwater has completed projects that provide water and waste water services to millions of people around the world. These services include water treatment, waste water treatment, infrastructure ownership, investment and operation, water asset management and consultancy.

One of Biwater's key markets is Africa, particularly sub-Saharan Africa, where the company has delivered over 100 projects in 15 countries with a value in excess of US\$1.3 billion. Millions more people now benefit from safe World Health Organization standard water.

While Biwater's core business is the delivery of water and waste water solutions, the company has adapted and responded to the major challenge faced in delivering water projects in Africa – the lack of funding.

Lack of investment in water and sanitation has hampered progress in meeting the Millennium Development Goals, and in particular has penalised poorer communities who often pay a much higher rate than the utility tariff as they are forced to buy untreated water from informal vendors.

## SUSTAINABILITY

There are many challenges to raising finance and in particular matching available funding to a developing country's needs. Funding agencies now require that investments focus on sustainable delivery, rather than construction of infrastructure alone, and hence there is a need for a partnership approach to securing finance.

By identifying feasible projects, Biwater develops business plans in cooperation with governments and funding agencies to overcome these challenges. This multi-stakeholder approach has enabled Biwater to successfully finance large water and waste water projects, not only providing cost savings and health benefits but actively encouraging economic growth.

Over the past five years or so Biwater has arranged funding in excess of US\$450 million for water projects and has received international accolades including a Trade Finance Deal of the Year for "its innovative funding structure", and a Global Water Intelligence Sustainability Award for "an inspired and technically brilliant solution from Biwater – probably the

most significant step towards the Millennium Development Goals in sub-Saharan Africa in 2008".

## LOCAL UNDERSTANDING

Biwater's long-term presence in Africa has allowed it to build a unique knowledge of working conditions and customs which has put the company in a strong position to tackle complex projects in areas where many companies are hesitant to work.

Africa remains an important region for Biwater and it is committed to continue to work in partnership with governments and funding agencies to improve the provision of water and waste water services to the community.

Our innovative financial engineering will continue to reap benefits for African communities through the supply of clean affordable water.

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# PUBLIC-PRIVATE PARTNERSHIPS IN THE NIGERIAN WATER SECTOR



## WELCOME MESSAGE

It is my pleasure to welcome you to the Federal Ministry of Water Resources. Our country has a population of over 160 million people, abundant water resources and good weather; the water sector of Nigeria is ready for investors.

With the establishment of the National PPP Policy, and the PPP Regulatory Agency (The Infrastructure Concession Regulatory Commission), the investment environment has been made attractive to ensure value to investors and stakeholders.

We have a large population without potable water who

are ready and willing to pay for good service delivery. An untapped, large expanse of arable land is available for irrigated agriculture. A substantial endowment of dams and rivers is suitable for small and medium hydropower generation. High volumes of aquaculture and horticulture potentials, plus many value chain activities, are waiting for investors.

The Federal Government has also set aside incentives to support private investment in the water sector, ranging from access to land, issue of permits and licences, partial risk guarantees, to viability gap funding to ensure return on private investments.



It is therefore our hope that investors will make the best use of the current investment opportunities in the water sector of Nigeria and partner with us to provide sustainable water service delivery to our people.

**Mrs Sarah Reng Ocheke**  
**Honourable Minister**

## THE WATER SECTOR

Nigeria is the most populous country in Africa and is endowed with abundant fresh water resources, spreading all over the country from the coastal region to the arid zone of Lake Chad Basin.

The country is essentially drained by two river systems, the Niger-Benue and the Chad, with the exception of a few rivers that empty directly into the Atlantic Ocean; all other rivers drain into the Chad Basin or River Niger-Benue system. Nigeria's huge water resource potential is estimated at 267 billion cubic metres of surface water, and 52 billion cubic metres of groundwater.

About 60 per cent of the country is underlain by crystalline rocks of the basement complex, 20 per cent by consolidated sedimentary materials, and 20 per cent by unconsolidated sedimentary materials. Static water levels in water wells range from zero in parts of the coastal alluvium to 200 metres in some sedimentary areas. Generally, the water quality is good, except for about 20 per cent of the country, which is underlain by highly corrosive groundwater.

Under the Nigerian constitution, the responsibility for water matters is shared by the three tiers of government: federal, state and local. The Federal Ministry of Water Resources is responsible for

policy formulation, coordination, planning and capital investments for water resources development. The Ministry has 12 River Basin Development Authorities in charge of management and operations of the river basins, and has also established an Integrated Water Resources Regulatory Commission for regulation of Catchment Management Areas. At the state level, the water sector is coordinated by State Ministries of Water Resources, while Water Agencies have been set up to deliver water services to citizens. At the local government level, Water, Sanitation and Hygiene Departments or Units provide water services to the villages.



There are a number of policies that guide programme delivery in the country. Water resources are an important component of the Federal Government of Nigeria's development framework, and have an important role in the realisation of the country's desire to be among the top 20 economies by the year 2020.

The public-private partnership (PPP) approach to government business is one of the most sustainable, not only for developing countries but for the developed world. In the past two decades, the model has led to the emergence of a number of economically and socially viable projects that have positively impacted the Nigerian people and also enhanced the bottom line of private businesses.

The Nigeria Transformation Agenda fully appreciates the value of PPP arrangements in fast-tracking the nation's economic and social development. The Federal Ministry of Water Resources has supported the

process by encouraging private sector participation. With this in mind, the Ministry has established a Water Sector Reform and Public-Private Partnership Unit to coordinate all the aspects and endeavours of private sector participation in the sector. In addition, it has created the Integrated Water Resources Management Commission to ensure adequate allocation, regulation and management of the available water resources.

The overarching objectives of seeking private partners for water sector development most importantly include:

- Addressing operational challenges in the water resources sector with private sector expertise
- Full utilisation of the available infrastructures (dams, irrigation, water supply, water quality facilities) to enhance food security and employment generation
- Harnessing the power generation potential of dams across the country, and
- Reducing the infrastructure

investment deficit in the sector through private sector finance.

The Ministry is promoting and facilitating PPP initiatives in the subsectors of water supply, irrigation and multipurpose dams.

#### KEY POLICY DOCUMENTS

- Nigeria Vision 20–2020 (Economic Transformation Blueprint)
- Water Resources Decree 101 (1993)
- National Water Supply and Sanitation Policy (2000)
- National Water Resources Policy
- National Water Resources Bill
- National Water-Sanitation Policy
- National Rural Water Supply and Sanitation Programme Strategic Framework (2004)
- National Environmental Sanitation Policy (2005)
- Water Sector Roadmap (2011)





### WATER SUPPLY

Access to drinkable water in Nigeria is about 60 per cent overall, 73 per cent for the urban population and 51 per cent for those in rural areas, based on the population and water supply coverage of the country in 2011 (MISCS 2011 report).

There are over 40,000 water supply infrastructure installations in Nigeria. Eleven per cent of those deal with surface water

#### GOVERNMENT INCENTIVES FOR INVESTORS IN THE WATER SECTOR

The Government of Nigeria has lined up a number of incentives for investors in the water sector. These include:

- Tax incentives
- Land acquisition
- Equity participation
- Access to concessionary loans
- Government subsidies:
  - Viability gap funding (VGF)
  - Cash injections
  - Partial risk guarantees.

(dams, rivers and streams).

The remaining 89 per cent is concerned with groundwater, with 34 per cent using motorised pumps and 55 per cent on hand pumps. The total combined installed capacity of all the schemes is about 5.1 million cubic metres per day – about 38 per cent of current water demand. This deficit is made even worse by the dysfunctional status of many of the schemes, which leaves them currently with a total combined output of about 2.5 million cubic metres. The situation has led to individuals and families making their own efforts to provide water supplies by sinking boreholes or wells from their homes.

The government is seeking investors to develop infrastructure for water supply improvement in Nigeria through the following models:

- Design, finance, build, operate and transfer water supply infrastructures for urban areas
- Design, co-finance, build, operate and transfer water supply infrastructures for small towns and villages.

### IRRIGATION

Nigeria has a total land area of about 91 million hectares, out of which about 82 million have been classified as arable land. Of the cultivable area, 42 per cent is being farmed under the bush fallow system, whereby land is left idle for a period of time to allow natural regeneration of soil fertility. Eighteen million hectares are classified as permanent pasture, but have the potential to support crops.

From the available impounded water, Nigeria has short-term irrigation potential of 3.14 million hectares of land, of which only 150,000 hectares has been developed. The existing large dams are capable of irrigating about 350,000 hectares of farmland. Nationwide, there are also 27 small earth dams that are currently under construction under government contracts, with a combined finished capacity to irrigate 2,700 hectares of farmland. In addition, 78 water control structures – small earth dams, concrete dykes and ponds – under the control of the Federal Ministry of Agriculture and



Rural Development have the combined capacity to irrigate 3,000 hectares of farmland. In sum, Nigeria's current level of water infrastructure can irrigate a total of 355,700 hectares. However, less than 25 per cent of the available irrigation infrastructure facilities are currently being utilised.

In response to this, the Ministry has identified over 30 small-scale irrigation schemes (of less than 5,000 hectares) and five large-scale schemes (over 5,000 hectares) to be leased or concessioned to the private sector through the following:

- Rehabilitation, operation and transfer the available irrigation infrastructure and farmlands for cropping
- Build, operate and transfer of additional and enhanced irrigation facilities on the existing dams of the available 350,000 hectares of irrigable land.

### **DAMS FOR MULTIPURPOSE USE**

Nigeria has about 264 medium and large dams with a combined

storage capacity of 33 billion cubic metres of water for multipurpose use (water supply, irrigation, hydropower, fisheries, eco-tourism etc.) of which 210 are owned by the Federal Government, 34 by the states and 20 by private organisations.

Considering the available surface water potential of 267 billion cubic metres, there is a lot of room for investors to partner with government on:

- Build, operate and transfer of dams for multi-purpose use, especially for generation of electricity, flood control, water supply and irrigation.

### **CONCESSION STRATEGY**

The Ministry has put in place appropriate measures that will ensure due process and transparency in engaging private partners for the water projects. It is also adequately equipped with the resources to manage the PPP procurement process and contracts, in accordance with the Nigeria PPP Law. This scope of work required to secure a concessionaire will entail three phases:

- Phase 1: preparation of outline business case for each project to determine technical, economic, financial and overall ongoing bankability
- Phase 2: transaction advisory services to structure the contracts and produce the bidding documents for engaging private partners, and
- Phase 3: procurement of the required private partner with adequate transparency and due diligence.

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# WATER SUPPLY AND RURAL DEVELOPMENT FOR TARABA STATE



Images left to right: School children collecting water from newly constructed hand pump borehole; Newly constructed Vented Improved pit latrine facility to stop open defecation; Children enjoying new school motorised water supply project.

Taraba State, in Nigeria, has a population of more than two million people. The focus of the current state administration is to balance sustainable development growth with the people's welfare and self-reliance by making a practical impact on socio-economic infrastructure, particularly in the rural communities. The Governor, HE Danbaba Danfulani Suntai, has reiterated the commitment to ensuring adequate water supply, sanitation and rural transformation services, and this vision is being zealously pursued by the Acting Governor, Alhaji Garba Umar.

The State Ministry of Water Resources and Rural Development has developed a four-year Blue-Print that identifies all issues and appropriate strategies and involves key partners at all levels to cooperate in meeting the challenges in the water, sanitation and rural development sectors. The Blue-Print is anchored on the Millennium Development Goals (MDG 7, Target 10) which calls for a 50 per cent reduction in the access gap by the end of 2015.

## THE NATIONAL AND INTERNATIONAL CONTEXT

The UNICEF/WHO Joint Monitoring Programme report of the water and sanitation MDGs at the end of 2012 revealed that about 37 per cent of the developing world's population still lack adequate sanitation facilities,

and over 780 million people, including Taraba citizens, still use unsafe drinking water sources. Poor sanitation, unsafe water supply and poor hygiene practices have many serious repercussions: thousands of children are killed or sickened every day. Low wage earners are less productive due to illness; health systems are overwhelmed and the state economies suffer. Without water, sanitation and hygiene (WASH), sustainable development is impossible.

The State's WASH and Rural Development Sectoral Blue-Print, with an annual budgetary requirement of over N7.25 billion (US\$45.3 million), is aimed at attracting funding support from government allies, including Taraba citizens, national and international partners. The state government alone cannot meet the financial obligations in these sectors, as there is already an established funding gap of between 35 and 40 per cent of the annual requirement.

## FISCAL STRATEGY FOR THE INVESTMENT PLAN

In view of the capital-intensive nature of water supply, sanitation, roads and rural electrification investments the Blue-Print has invoked the provisions of the National Water and Sanitation sector policy's national cost-sharing formula arrangement. Support is also expected from the Transformation Agenda of the Federal Government

of Nigeria, through which key sectors of the national economy will receive increased funding through the Petroleum Re-investment Subsidy Fund.

As of December 2012, the water and sanitation service coverage for Taraba State stood at only 35 per cent for safe water supply and 21 per cent for sanitation. The national and global expectation is for the state to attain 75 per cent coverage for both water supply and sanitation by 2015.

The cost implications of implementing the plan is obviously beyond the financial capacity of the state government alone and the need to solicit for support of the Federal Government of Nigeria and the international community is now imperative, considering both the short and long term socio-economic benefits of good water supply, sanitation and rural infrastructure to the state and the nation as a whole. Indeed, for Taraba State, the Blue-Print for WASH and rural development is the key to the economic transformation of our populace.

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# SUSTAINABLE SANITATION FOR AFRICA'S GROWING CITIES



**Christoph Lüthi** and **Rahul Ingle** at the **Sustainable Sanitation Alliance** illustrate how the demands of sustainable development require us to rethink the way sewage waste is managed in urban areas.

Africa's rapidly expanding metropolitan areas and urbanising societies are constricted by global change limited resources, higher energy prices and accelerating urban environmental degradation. Fresh ideas and breakthrough solutions are required as two-thirds of humankind are expected to be urban residents by 2030. The authors give details of successful innovative schemes in low-income city areas of Africa.

Today, 18 out of the world's 21 megacities with populations of 10 million or more are found in low and middle-income countries. These agglomerations feature huge spatial and resource footprints, covering hundreds of square kilometres. Fortunately, they also provide opportunities for less centralised, more localised

solutions, which help safeguard fresh water sources and recycle valuable nutrients.

“Fresh ideas and breakthrough solutions are required as two-thirds of humankind are expected to be urban residents by 2030.”

Typically, fewer than 10 per cent of the population of sub-Saharan African cities are connected to

sewers, and these are mostly in central business districts and upper-class residential neighbourhoods. Fully networked services remain decades in the future because of the enormous costs involved in installing them in metropolitan areas. This presents a real opportunity for a paradigm shift in sanitation leading to three main aims:

1. A closed-loop recycling economy: the 'three Rs' – reduce, re-use and recycle
2. Resource efficiency: minimising the use of scarce natural resources and reducing long-term dependency on energy and transport costs
3. Integrated approaches: fully utilising urban space and incorporating sanitation and re-use systems into adaptive urban design.



Providing water and sanitation infrastructure for Africa's rapidly growing secondary cities is a formidable challenge



### SUSTAINABLE CHOICES FOR ALL AREAS

Past experience reveals that it is in many cases inappropriate and unsustainable to import sanitation planning models from the industrialised world. Implementing a centralised one-size-fits-all solution just does not work. Planning approaches must be adapted to allow for improved development and implementation of context-specific sanitation systems. Recent innovations in sanitation planning include; a more integrated planning approach, greater emphasis on the actual needs and financial capacity of the users and wider participation and consultation with all stakeholders, especially during the initial design and priority setting stage. There should be no domains that are left aside as low priority areas.

But how can African cities tackle the double challenge of providing sustainable access to safe, efficient

and affordable sanitation facilities, while re using water, recycling nutrients and preventing wastage? Cities aiming at finding more sustainable sanitation solutions first need to provide improved and more affordable facilities, especially for the urban poor and second, to ensure the financial viability of the entire sanitation system, from the user interface (private or shared toilet) via transport to treatment and final disposal or re-use.

### SUCCESS STORY CASE STUDIES

A number of cities lead the way in innovative solutions in three key sustainability areas:

1. Providing sanitation at scale for the urban poor
2. Turning waste into energy
3. Recycling nutrients

Zambia's Devolution Trust Fund (see case study 1 for further details) and the eThekweni Municipal Water Services Department in South Africa (see case study 2 for

State of the art sanitation technology transforms human waste into valuable nutrients.

further details) are good examples of initiatives that have found sustainable sanitation solutions.

### Water and sanitation for all

Since 2003, the Zambian Devolution Trust Fund (DTF) has been funding water supply and sanitation service delivery for Zambia's urban commercial utilities. DTF finances commercial water utilities in a competitive way (call for proposal procedure) that builds and operates water services and low cost sanitation services in urban low income areas.

### CASE STUDY 1: ZAMBIA'S DEVOLUTION TRUST FUND

In 2010, only 57 per cent of Zambia's urban population had access to adequate sanitation, with less than a quarter of Lusaka's population using flush or pour flush toilets. To provide access to water and sanitation the Devolution Trust Fund (DTF) was established by NWASCO (National Water Supply and Sanitation Council) as a funding vehicle to assist commercial water utilities (CUs) in improving their services. DTF is funded through a basket funding mechanism by the German Federal Ministry for Economic Cooperation and development (BMZ), the Australian Agency for International Development (AusAID), the Danish International Development Agency (DANIDA) and the EU.

The three main guiding principles of DTF are:

1. To work exclusively through CUs in the urban, peri-urban and low-income areas
2. To adopt a demand driven approach to development
3. To introduce and promote low cost household sanitation options

The DTF uses a 'Call for Proposals' procedure to invite for project proposals from CUs, after the assessment which is based on a predefined prioritisation criteria (i.e. cost per beneficiary, actual water supply and sanitation coverage etc), successful proposals are funded and implemented following a defined project implementation plan. The CUs provide for the promotion of sanitation options, facilitation during implementation and provision of expertise and backbone infrastructure wherever necessary.

The DTF, operational since 2003, has funded four sanitation projects throughout the country with over 15,600 people reached directly with access to improved sanitation services and over 6,000,000 people indirectly through its intervention with approximately €0.5 spent per recipient. A sewer-based decentralised sanitation approach (DEWATS) for low-income areas was developed and has been demonstrated in four pilot projects that include; a standardised baseline, a comprehensive community participation approach and a system to monitor the implementation progress. More affordable solutions for unplanned peri-urban areas, using onsite dry sanitation solutions and faecal sludge management concepts are currently being developed.

In addition, a utility efficiency task force assists utility organisations in improving their operations and maintenance and providing tailor-made advisory services. This also enables the water and sanitation service providers to better implement and operate the sanitation projects.

### CASE STUDY 2: ALTERNATIVES TO WATERBORNE SEWAGE IN eTHEKWINI, SOUTH AFRICA

The eThekweni Metropolitan Municipality, which includes Durban, is the third largest metropolitan area in South Africa covering approximately 2,297 km<sup>2</sup>, with a total population of 3.4 million. Settlement patterns in the peri-urban interface of the eThekweni metropolitan area are characterised by relatively large plots (from 200 to 1,000 m<sup>2</sup>). The eThekweni Municipal Water Services Department had been looking for cost-effective alternatives to waterborne sewage for the vast peri-urban settlements unlikely to be connected to the city's sewerage system in the short to medium term. This project has been running since 2004.

Although double vault urine diversion dehydrating toilets (UDDT) are about US\$250 more expensive than the ventilated improved pit latrines, they were considered a more viable option due to their considerably lower operating costs (they do not require external emptying service providers). A national subsidy scheme, the Municipal Infrastructure Grant (MIG), was used to subsidise high quality urine diversion toilets to assist the poor in gaining access to basic infrastructure at household level. To date, over 90,000 UDDTs have been installed in eThekweni's peri-urban settlement areas. Acceptance among first time users is high, as most households in these areas were previously using unimproved pit latrines. Since September 2008, UDDTs have been officially recognised by the Minister of Water Affairs as a sustainable toilet option for South Africa.

Initially, neither the dried faeces nor the urine were collected, but buried on site and filtrated into a soakaway, respectively. Now that urine diverting toilets are so widespread and land use patterns are changing, the eThekweni Municipality is interested in improving the management and treatment of urine. Research is focusing on studying the technical, managerial and economic feasibility of struvite fertiliser production from separated urine. The potential to turn urine into a marketable commodity and provide a source of revenue for the poor would mean that future nutrient recovery is set to become a reality in eThekweni.

**Energy capture**

Many cities are successfully extracting methane gas from landfill sites to generate electricity. In Durban, South Africa, gas from digesters and sewage treatment plants is being harvested to generate electricity and thus reduce dependency on coal as an energy source.

**Recycling nutrients**

State of the art sanitation technology transforms human waste into valuable nutrients in the form of fertiliser, eco-humus

“Research is focusing on studying the technical, managerial and economic feasibility of struvite fertiliser production from separated urine.”

or by-products such as animal fodder. The Municipal Corporation of Kolhapur, India, introduced a City Sanitation Plan encouraging decentralised sanitation technology options, such as biogas reactors and systems to promote agricultural re-use of treated sludge.

**PATHWAYS TO SANITATION SUSTAINABILITY**

Cities seeking to reduce their resource and energy footprint will need to rethink their conventional sanitation management processes, systems and technologies and start moving onto a more sustainable and energy efficient trajectory. Pathways towards this are outlined below.

**Technology options:**

- Resource recovery technologies rather than ‘end-of-pipe’ technologies
- Small-scale ‘decentralised’ sewage treatment
- Combination of high-tech and low-tech solutions
- Biogas reactors for energy production

**Management processes**

- Holistic design and planning processes integrating land, water and environmental sanitation issues
- Localised participatory processes encouraging community ownership
- Interdisciplinary, multi-stakeholder planning approaches
- Systems approach to sanitation.

City managers should start incrementally and build up momentum step by step, by directing their efforts towards:

- Drafting and signing an Urban Sanitation Charter to underline institutional and political commitment to sustainable sanitation and collaborative capacity building.
- Working towards integrated sanitation solutions using multi-stakeholder planning approaches, such as Sanitation 21, City Sanitation Plans, Community-Led Urban Environmental Sanitation (CLUES).
- Starting with ‘low hanging fruit’, quick-start projects that build confidence and underline local authority commitment, such as community managed public toilets or inclusive planning workshops in disenfranchised city areas.
- Demonstrating that sanitation is a worthwhile investment: new studies show that improved sanitation in low-

income countries typically yields about US\$9 worth for every US\$1 spent. Cities can capitalise on lower-cost technologies by keeping project costs low (as shown in the two boxed case studies).

**Dr. Christoph Lüthi** is a senior scientist at the Swiss Federal Institute of Aquatic Science and Technology (Eawag). He heads a research team on strategic sanitation planning for cities in the global south and co-leads the Cities and Planning Working Group in the Sustainable Sanitation Alliance.

**Rahul Ingle** is an architect and infrastructure planner working as a programme officer at GIZ GmbH, Germany. He currently heads the working groups on Cities and Planning and Links to Renewable Energies and Climate Change in the Sustainable Sanitation Alliance.

**The Sustainable Sanitation**

**Alliance (SuSanA)** is a loose network of 177 partner organisations working together to promote sustainable sanitation solutions in urban and rural contexts through knowledge sharing and joint publications.

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## Atkins' holistic assessment of the role and benefits of water use in Malawi

Malawi has a largely agricultural economy heavily dependent on water. With ever-increasing pressure on valuable land and water resources, the Government of Malawi responded to the risks to economic development and poverty reduction from poor water resource management. Atkins was commissioned by the Government of Malawi to prepare a Water Resources Investment Strategy to reduce Malawi's vulnerability through optimum allocation of water resources and reducing geographical and temporal variability.

The project, which ran from 2010 to 2012, had two elements:

**Water resource assessment.** We developed a comprehensive understanding of Malawi's existing and potential future water resources, including collection of data and implementation of a countrywide Water Resources Management Information System (WRMIS).

**Investment strategy.** We carried out economic and financial analyses to identify the optimal selection of water resource investments under a range of economic development and climate change scenarios. We used hydro-economic modelling to assess the optimal allocation of resources, and carried out extensive stakeholder engagement to develop an agreed water resources investment strategy.

Our team of hydrologists, hydrogeologists, water resource planners and institutional design specialists completed a data collection and collation exercise to develop a more detailed methodology for the project. The methodology was discussed and agreed with the government, and became the blueprint for the programme.

In Phase 1 we completed a comprehensive assessment of Malawi's water resources opportunities and constraints, with key issues being surface/ground water; water quality; infrastructure status; water supply-demand balances; and catchment degradation information. This component focused on data as a product and a service, in terms of reviewing needs, designing collection strategies, storing, managing and analysing the data collected, and designing useful and informative outputs from the data analysis.

We developed a geographic information system (GIS) to store, manage and present the data regionally. This also provided a valuable tool for the prioritisation, planning and presentation of activities and investments over time.

In Phase 2, drawing heavily on our robust data and information, we developed the investment strategy: identifying key water sector interventions, recommending priority investments, analysing alternative options for the implementation of investment, and consulting with stakeholders. We devised bespoke financial models to identify the optimum allocation of water sector investments to achieve the development targets. Given uncertainties such as varying policy options for economic development, rate of population growth and climate change, sensitivity analysis was required to test the robustness of the plans.

As the investment strategy process was well received by stakeholders and government, we were commissioned by the Ministry of Water Development and Irrigation to provide capacity building to better equip their staff in developing and supervising water management investments.



# WATER INFRASTRUCTURE FOR HYDROPOWER AND AGRICULTURE



**Bai-Mass Taal**, Executive Secretary of the **African Ministers' Council on Water** explores the current role and the potential of water infrastructure for hydropower and agriculture.

Water underpins nearly every aspect of economic growth, therefore providing the necessary infrastructure for managing the resource efficiently becomes highly imperative. Of particular focus is infrastructure for agricultural development and hydropower and, where possible, infrastructure developed for multiple uses including water supply and sanitation.

The focus on hydropower is driven by the understanding that there is a need to grow the link between water and energy for development. In Africa, electricity generation is the lowest in the world and hydropower potential is sorely under developed with only 32 per cent of the energy production in Africa being supplied from hydroelectricity.

Indeed, only three per cent of Africa's renewable water resources are exploited for hydroelectricity, compared to an average of 52 per cent in Asia, 45 per cent in OECD countries and 21 per cent in Latin America.

## **AFRICA THE UNDER-DAMMED CONTINENT**

Africa has been variously referred to as the 'under-dammed' continent, with suggests plenty of scope for a dam-building boom, and yet constraints remain. The capacity to generate hydropower is grossly unequal across the continent with average hydropower potential in north Africa being around 41,000 GWh compared to 653,361 GWh in central Africa.

The case of central Africa's sub-region is especially significant as

Only three per cent of Africa's renewable water resources are exploited for hydroelectricity.

it is the region with the lowest electricity generation on the continent. In spite of this sub-region having the second highest hydroelectric potential on the continent only 2.6 per cent of its energy comes from hydropower production. This is the sort of statistic we must look to change.

Another hindering factor is that rainfall and climate variability will exacerbate the challenges that

Total African potential: 1.750 TWh

Data for top 10 countries in TeraWatt Hours (TWh)

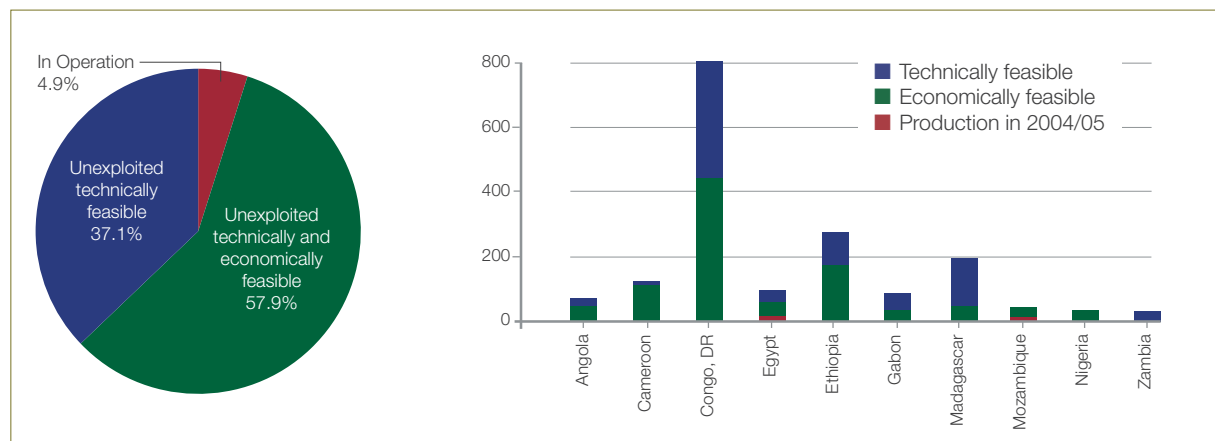


Figure 1. African hydropower potential

raise uncertainty in hydropower development. Of equal concern are the environmental and social impacts associated with developing large dams. Yet these constraints should not deter the continent from acknowledging the enormous potential in developing hydropower infrastructure, leveraging the economic growth stimulus and ultimately improving human well-being. Therefore the answer seems to be for Africa to invest more in hydroelectricity infrastructure rather than in fossil fuels. In an era of climate change, this approach makes sense, and also offers Africa the least-cost energy supply with zero carbon emissions.

### MORE PEOPLE = MORE CROPS & MORE WATER

At the same time, there is a high potential for the role of agriculture in reducing poverty and contributing to economic development across large parts of the continent. However, rising scarcity of fresh water poses one of the greatest threats to food security in a world with projections of astronomical increase in population. For instance, it is estimated that global population will hit 8.9 billion by 2050 from the year 2000 figure of 6.1 billion, an increase of 45 per cent. Matters are made worse

by the fact that an estimated 3.5 billion people will live in countries that will be unable to feed their populations by 2025.

In the midst of these growing challenges, rain-fed agriculture, which many farmers in developing countries rely on, is becoming more unreliable. This is due to climate variability, the over exploitation of groundwater and the increasing threat of rising pollution. Worse still, African farmers' continued dependence on increasing the area of land cultivated for additional food is becoming unsustainable, as good land becomes less and less available. Therefore, how to increase yields per unit of land while dealing with climate variability is a challenge Africa will have to answer.

### A NEED FOR INTELLIGENT ANSWERS

To respond to the expected population growth, there arises a need to drive an agenda for improved water infrastructure for agricultural use on the continent. Through better technology and climate resilient infrastructure, we need to develop more efficient and productive ways to use the scarce water resources available. Innovation for infrastructure for rain-fed and irrigated agriculture needs to be intensified with

technology developed for effective re-use of wastewater while still maintaining required nutrient levels necessary for improved agriculture.

Water resource infrastructure has strong links to both climate change mitigation and adaptation strategies in terms of the need to adopt climate-proof and resilient measures for developing future infrastructure. Countries that are bordered by rivers may need to focus on joint development of trans-boundary infrastructure that can serve their needs and support regional growth and economic integration.

### KEY ACTIONS

To drive the water infrastructure engine, there is the need to urgently take a number of key actions:

#### 1. Creating an enabling policy framework

The policy framework issues include the need to raise awareness of the water, food and energy nexus and to ensure that national policies support appropriate infrastructure development. These necessary infrastructure policies must also take a cross-sectoral view of the inter linkages.

#### 2. Investment and funding

Appropriate investment and funding for the infrastructure



agenda is critical, both in terms of operational and capital expenditure. Poor access to sustainable funding has been one of the factors hindering appropriate infrastructure development in Africa. Investment in integrated water resources infrastructure for multiple uses is therefore the way to go.

### 3. Infrastructure management

It is important that the infrastructure agenda is not solely focused on the development of new infrastructure in order to improve the water, food and energy capacities across countries and regions. The management,

rehabilitation and optimisation of existing infrastructure also form a critical part of the efforts to drive sustainable growth and development across the continent.

### 4. Review, monitor and report

The monitoring and reporting on infrastructure trends is important in measuring the achievements and in understanding areas of concern, whether related to specific geographical areas, or specific elements of the infrastructure cycle such as funding, construction, operation and maintenance; or mitigating social and environmental impacts.

**Bai-Mass Taal**, the first Executive Secretary of the African Ministers' Council on Water (AMCOW) is an environment and water specialist and has served as a Cabinet Minister in his country, The Gambia, first as Secretary of State for Fisheries, Natural Resources and the Environment and later as Secretary of State for Fisheries and Water Resources. Bai-Mass has an illustrious record in national and international civil service arenas, including the United Nations system. He continues to actively bring to his job at AMCOW a formidable combination of skills in diplomacy, policy formulation, partnership building, programme development and management, resource mobilisation, capacity building and institution management.

**African Ministers' Council on Water** (AMCOW) was formed in 2002 in Abuja, Nigeria, primarily to promote cooperation, security, social and economic development and poverty eradication among member states through the effective management of the continent's water resources and provision of water supply services.

In 2008, Heads of State and Government of the AU agreed on commitments to accelerate the achievement of water and sanitation goals in Africa and mandated AMCOW to develop and follow up an implementation strategy for these commitments. AMCOW has also been accorded the status of a Specialised Committee for Water and Sanitation in the African Union.

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Connecting  
the continent



# ICT IN AFRICA: TRENDS AND INVESTMENT OPPORTUNITIES

**The African Development Bank** highlights trends and investment opportunities in information and communication technology (ICT) in Africa as part of their medium term ICT operations action plan.

Africa's ICT sector has seen unprecedented growth in recent years. The private sector has invested close to US\$50 billion in the last decade, with a focus on mobile and related applications, and more recently in international submarine cables. Mobile density in the continent jumped from 20 per cent (in terms of the number of SIM cards sold per 100 inhabitants) in 2005, to around 65 per cent in 2011. Recent completion of undersea cables has tripled available bandwidth. However, the rollout of ICT infrastructure, in particular access to the internet is uneven (internet penetration was about 11.5 per cent in 2011) and many underserved countries and areas remain. In addition, the lack of regional and national backbone infrastructure is a stumbling

block towards the development of broadband Internet. The promotion of ICT in Africa still requires the investment of billions of US dollars.

## TRENDS IN THE MOBILE INDUSTRY

The dramatic growth of mobile telephony in Africa over the past decade has been well documented and remains a success story for the continent. The mobile industry in Africa contributes US\$56 billion to the regional economy, equivalent to 3.5 per cent of total GDP. Key trends of the mobile industry are highlighted below:

Competition in the mobile market is high. The number of operators per market has increased, most markets having now at least three operators.

Fierce competition has driven down prices and increased penetration.

The continent's mobile penetration in terms of SIM cards sold reached 649 million (65 per cent) at the end of 2011. This reflects significant growth as it compares with a penetration rate of 20 per cent in 2005. User penetration, which discounts the strong trend of using multiple SIM cards, lags behind at around 35 per cent, however. This shows that Africa still remains behind other continents in providing mobile access to rural population.

The number of mobile subscribers is expected to continue to grow, though with a slowdown. This results from increased competition and tightening addressable market.

In particular, profitability is declining as a result of two factors, expanding coverage to underserved rural areas comes at an increased cost and marginal revenue per user is declining as operators look to acquire new subscribers at low-income levels. The extreme pricing pressure and regulatory risks will affect the investment environment in the future. Poor road infrastructure that makes it expensive to transport equipment to set up mobile towers, and a dependence on diesel generators to power towers in areas where there is insufficient electricity are factors driving up investment costs in Africa.

Mobile value-added services have been launched throughout the continent to enable and support agriculture, banking, education, healthcare and gender equality. There has been a significant growth of mobile banking in the region opening the way for increased use of mobile networks for electronic transaction. The number of mobile broadband users has increased significantly with direct impact on productivity, social networking and more recently on governance.

### TRENDS IN INTERNET BROADBAND

The spectacular growth in the mobile sector has not been replicated in the internet sector, as access to broadband has been very limited in Africa over the last decade. Internet penetration was about 11.5 per cent in 2011. However, as submarine cables find their way along Africa's coastlines, the continent is slowly but steadily emerging from an era characterised by excessively high prices, near zero broadband penetration rates and self-defeating regulatory models. The African bandwidth revolution is nearly here, with all its implications for economic growth, social transformation business models and investment

opportunities. Key trends of the market are as follows.

Most African countries now have commercial DSL services, but their growth is limited by the poor geographical reach of the traditional fixed-line networks. Access to rural areas was made possible through national backbones and the rapid spread of mobile data and third-generation (3G) broadband services. Many fixed-line incumbents have also reacted by rolling out fixed-wireless access networks to expand their geographical reach. The technology of choice has been CDMA-2000 that supports broadband data rates with an upgrade to EV-DO standard. The mobile broadband penetration was 3.79 per cent, while the fixed broadband internet penetration was merely 0.2 per cent in 2011. National backbones remain a major supply bottleneck, and probably the weak link in the emerging African broadband infrastructure value chain.

There has been progress with regard to national backbones in Africa. Angola, Botswana, Ethiopia, Ghana, Rwanda, Burundi, Kenya, Malawi, Madagascar, Uganda, Tanzania, Sudan, and South Africa are among the countries that have launched plans for the development of their national backbone networks over the last two years. Yet, a substantial gap remains in the majority of the countries, particularly those in Central and Western Africa. In contrast, the regional backbone has seen limited private sector interest due to the diversity of regulatory frameworks and unattractiveness of some of the routes due to high sunk costs. Fibre backbones have been growing in Southern Africa, however, with South Africa acting as a hub for surrounding countries, and in western Africa, with Nigeria, Ghana and Senegal acting as connectivity

hubs in the region. This is not incidental, as broadband network investments tend to follow regional trade and economic activities, with the goal of connecting profitable urban centres rather than rural and underserved areas. The major regional broadband gap is in West, Central and Eastern Africa.

There has been a significant growth of mobile banking in the region opening the way for increased use of mobile networks.

Challenges to the African ICT sector:

1. Building the missing gaps in regional and national backbone infrastructure
2. Removing policy and regulatory restrictions including restrictions on licensing and market entry and promoting universal access to affordable broadband Internet
3. Leveraging existing broadband infrastructure by aggregating demand and scaling up applications in the public sector through e-government, e-business, e-health, e-education and e-agriculture services
4. Building skills and competitiveness in RMCs for the knowledge economy
5. Promoting ICT use to support trade and regional integration.

### TRENDS IN ICT SECTOR INVESTMENT

The private sector continues to be the main driver for investment in the ICT sector in Africa. Studies by the International

Telecommunications Union (ITU) and the OECD concluded that, despite the international financial crisis, ICT in Africa remains an attractive business area and that several investment deals were concluded in late 2008 and 2009. In 2007, the private sector committed to increase investment in telecommunications from US\$35 billion to US\$50 billion by 2012. It is important to note that private investment was largely focused on the mobile networks and related applications that are easy to scale up and potentially more lucrative compared to fixed and broadband networks.

Public sector investment in ICT has improved considerably over the last decade, but challenges remain in scaling up current ICT usage in government. Efforts in systematically integrating ICT in government and key sectors such as health, education and agriculture have been ad hoc and primarily focused more on automation than transformation of services. Moreover, although many RMCs have developed e-strategies, they are still unable to turn them into useful application due to inadequate appreciation of the complex interaction between policy and regulation, access, skills and technological innovations. Countries like Egypt, Mauritius and Tunisia that have shifted from simply drawing up a “laundry list” of ICT applications to catalytic interventions in infrastructure, policy and regulation, capacity and skills and scaled up applications in the public sector have benefited from ICT enormously.

A significant potential exists for the participation of low and middle-income African countries in the IT Enabled Services (ITES) sector that will exploit available broadband infrastructure. The ICT based services represent a US\$500 billion addressable

market, of which only about 20 per cent has been realised. A huge potential exists for African countries that take concerted efforts in building the requisite infrastructure and advanced skills in software engineering, project management, networking and creating an enabling legal and regulatory environment including laws for online transactions. Egypt, Mauritius, Morocco, South Africa and Tunisia have already tapped into the ITES market, the potential exists for increased employment and improved innovation in other countries.

### DEVELOPMENT ASSISTANCE IN THE ICT SECTOR

Substantial development assistance has been channelled to the ICT sector in Africa. Development partners are bent on improving the capacities of regulators and policy makers to appreciate the complex linkages between access to broadband, policy and regulatory frameworks and increased usage of the available network. The World Bank, for example, is spending a total of US\$424 million to finance the Regional Communications Infrastructure Program (RCIP) that aims to bring affordable high speed connectivity in eastern and southern Africa from which Burundi, Kenya, Madagascar, Malawi, Mozambique, Rwanda and Tanzania have benefited. A similar project for US\$215 million was approved in 2009 to promote connectivity in central Africa with focus on connectivity, policy and regulatory capacity and e-government applications.

The EU is another player in the sector, in particular with the financing of the creation of Regional Research and Education Networks. One such initiative is the newly funded AfricaConnect project with a total budget of 14.75 million with the aim to

establish a high-capacity internet network for research and education in southern and eastern Africa to provide the region with a gateway to global research collaboration. The initiative will undoubtedly have a significant impact on Africa's competitiveness and innovation.

### TO CONCLUDE

In sum, the ICT sector has made considerable progress in the mobile sector and international undersea cables, but gaps remain in the regional and national backbone segment. There has been a significant progress with regard to sector reforms and the participation of middle-income countries in the IT Enabled Services market. Adequate use of the installed network and promoting affordable access to underserved users remain a challenge for African countries.

**The African Development Bank Group** (AfDB) is a multilateral development finance institution established to contribute to the economic development and social progress of African countries. Founded in 1964, the AfDB's mission is to fight poverty and improve living conditions on the continent through promoting the investment of public and private capital in projects and programmes that are likely to contribute to the economic and social development of the region. The AfDB is a financial provider to African governments and private companies investing in the regional member countries.

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*Make a fast move and choose the Kenya's Silicon Savannah and you will never regret it. Konza Techno City is the place to call home, the place to invest, and the place to do business.*

## KONZA TECHNO CITY INVESTMENT OPPORTUNITY

Kenya's long-term development strategy, the Kenya Vision 2030, plans to promote the information technology enabled services (ITES) industry through the establishment of a smart city known as Konza Techno City, being established on a 5,000 acre greenfield area 60 km south-east of Nairobi along the A109 Mombasa Road. Konza Techno City will compete economically and culturally with the best cities in the world. The city will be a sustainable, world class technology hub and a major economic driver for the nation, with a vibrant mix of business, workers, residents and urban amenities.

Investing in Konza Techno City is a great opportunity for both international and local businesses and investors. Konza offers the best location to do business in Africa and one of the most sought-after international commercial investment opportunities. The new city provides some of the most valuable and attractive real estate investments in the country.

The Konza Techno City Master Plan provides for state-of-the-art business and science parks that offer flexible, high quality office and industrial space in an inviting setting, to attract and suit the needs of global technology firms. The major growth areas being targeted include ITES, particularly the business process outsourcing (BPO) market segment where global growth is increasing rapidly.

Konza Techno City central business district offers an alternative business location, with the vitality and buzz of an international city centre, offering a wide range of shopping, eating, leisure

and cultural attractions. The city will also be characterised by world class architecture – office space and hotels, large-scale commercial shopping malls, recreation and entertainment venues, and community support services such as health, clinics, green space, educational institutions and houses of worship.

Konza Techno City is designed to allow phased development, permitting rapid growth while ensuring the civic amenities and infrastructure to grow in line with the population needs. The country is already connected with a highly successful national backbone and sea cable link to the Middle East and the rest of the world, ensuring global connectivity. Sustainability is at the heart of the Master Plan for the city as it meets the highest international environmental standards. Phase 1 will be rolled out within five years, with a total of 1.5 million sq metres of office space, universities, health centres, science parks, BPO Parks and residential buildings. The central business district will be developed for a projected 16,000 workers, and a total of 30,000 residents.

Kenya's track record in sound economic management has been validated through independent external reviews by international financial institutions and rating agencies. The latest Country Policy and Institutional Assessment (CPIA) scores released by the World Bank in June 2012 placed Kenya at 3.8 out of a maximum of 5. This is well above the average for low income countries, at 3.3. The score is even higher for economic management and structural policies, which averaged 4.1. On credit ratings, Kenya is B+ stable on Standard and Poor's, and B+ positive on Fitch. Instruments are being provided to enable public-private partnerships.

**Kenya invites international investors and business operators to take the opportunity to invest in Konza Techno City. For more information please go to [www.konzacity.co.ke](http://www.konzacity.co.ke).**



# INVESTING IN BROADBAND INFRASTRUCTURE



**Dr Hamadoun Touré**, Secretary-General of the **International Telecommunication Union** (ITU), examines the technical, policy and business decisions involved in the development of broadband infrastructure.

High-speed affordable broadband connectivity to the internet is essential to modern society, offering widely recognised economic and social benefits. The Broadband Commission for Digital Development recently produced a report, *The State of Broadband 2012*, to expand awareness and understanding of the importance of broadband networks, services and applications for generating economic growth and achieving social progress in a global context. Investment in infrastructure is a key aspect of broadband development. This article, abridged from the Broadband Commission's report, explores the factors creating a positive environment for broadband investments.

In order to foster broadband deployments, regardless of the

source of financing, operators must invest in infrastructure efficiently and optimally to make best use of available resources in the current challenging economic climate.

Rather than using a 'one size fits all' approach, the different infrastructure layers need to be addressed separately from a policy and financing perspective. Indeed, new investment models are needed to connect new subscribers, and to drive expansion in capacity in order to handle the anticipated explosion in data over the years to come.

To date, the private sector has had considerable success in providing efficient broadband infrastructure in many countries, and is well placed to drive (or keep pace with) technological evolution. Private investments need to be facilitated by public authorities to

ensure that a vibrant, sustainable private ICT sector exists with a long-term perspective.

Connecting new subscribers and handling the data explosion can be achieved by: regulatory flexibility, leaving operators greater freedom of choice, improved and more advanced technology, better usage of wavelengths and spectrum and new and improved network configurations, among other factors.

## CONFLICTING PRIORITIES

Investing in broadband is a complex challenge. National priorities for broadband availability tend to be long-term in focus, but the needs and returns of short-term capital investments must also be taken into account. A network is composed of three distinct layers with very different characteristics

	Order of costs	Payback period	Examples
Passive layer	70–80% of network costs	15 years	Trenches, ducts, dark fibre
Active infrastructure layer	20–30% of network costs	5–7 year rate of return	Electronic equipment, OSS, BSS
Service layer	N/A	A few months to 3 years	Content, services and applications

Figure 1. Investing in different network layers

Source: ITU, Alcatel-Lucent.

## The different infrastructure layers need to be addressed separately from a policy and financing perspective.

in respect to their cost and return on investment. The first layer, the passive layer (civil works and dark fibre), can account for up to 80 per cent of the cost and has a payback period of approximately 15 years (see Figure 1.). The second is the active infrastructure layer, where the intelligence of the network concentrates, with a 5 to 7 year rate of return. The service layer has a very different cost structure and a much shorter rate of return. Different sources of financing are best suited to different types of investment in different network layers, characterised by different payback periods.

The passive layer underpins the other layers, with longer-term rates of return. Depending on market conditions, it may make sense in some cases to share it voluntarily, co-finance it and make it open. Passive infrastructure sharing can lower the cost of civil engineering work by sharing network segments and ducts (the terminals may not need to be replicated). Active infrastructure sharing – where

### REGULATION FOR OPEN ACCESS

There is an emerging regulatory consensus on the requirement for open access to national broadband infrastructure. Even in the most developed markets, the scale and scope of investment required for broadband networks tend to limit the market to one dominant provider. Except in the most densely populated geographic markets, fibre access pipes remain an essential facility or bottleneck, for which duplication is neither commercially nor economically viable. Regulatory action for broadband networks should seek to ensure access on fair, reasonable and non-discriminatory terms.

Open access is especially critical where broadband and NGA rollout is supported, at least in part, by public funding in the passive infrastructure level. In such circumstances, mandated open access can play a pivotal role in promoting network investment, in preventing uneconomic duplication of resources, and in strengthening competition. European State Aid rules make this particularly clear, so the provision of public funding to broadband infrastructure projects is dependent on a commitment to open access.

However, it is equally important that open access be established in such a way as to retain incentives for infrastructure investment. Care must be taken, for example, when open access is mandated as a condition of receiving state subsidies for infrastructure investment. The EU Recommendations are particularly concerned with this issue, as strict EU State Aid rules prohibit subsidy of any infrastructure that could be provided under competitive supply conditions. In other words, state aid must not distort the markets. This means that subsidies should be provided up to, but not beyond, the point at which the broadband investment becomes commercially viable. The means of identifying this tipping point is typically through an auction.

Regulators need to be wary of imposing terms for open access that are overly onerous, such as low access prices that squeeze the potential returns on investment. To the extent that these terms reduce returns on investment, they increase the costs of network infrastructure for private investors; this, in turn, ultimately increases the amount of public funds needed. In this regard, onerous terms also reduce expected payback on the public investment. It is likely to be counterproductive for the regulator to drive too hard a bargain.

Source: ITU Trends in Telecom Reform 2012.





equipment and IT platforms for business and operations support are shared – may be optimal where there is no viable business case.

For mobile networks, sharing infrastructure (e.g. sharing civil works, passive to active infrastructure, and in some cases even wavelengths or spectrum) needs to be evaluated carefully on a case-by-case basis, in order to avoid discouraging investment or undermining competition between different platforms. Today, open access (opening up network facilities to service providers on fair and equivalent terms) is gaining momentum as one way of curbing market dominance, while protecting incentives to invest (see box). When establishing public policies on broadband deployment, public authorities have to take into account the competitive consequences for other platforms (e.g. cable or mobile). Innovative radio frequency licensing schemes, passive infrastructure sharing and wholesaling capacity are also important trends to consider.

### THE MIX OF CONNECTION TECHNOLOGIES

How can we go about connecting new subscribers? Broadband services are usually provided through a mix of technologies, depending on geography and market analysis. In urban areas with high population density, private companies are likely to be willing to invest in commercially viable markets which may be easy to serve. Infrastructure-based competition may also be feasible.

In some countries, broadband can be provided to densely populated major cities and urban areas by laying a national fibre backbone infrastructure, for example. Many countries, including Australia, have government policies about extending broadband networks to

the premises or work with a mix of technologies to suit requirements. The use of optical technologies can help ensure scalability, reliability, and security in some cases. Leveraging existing infrastructure deployments (such as roads or electricity lines) can also help create backbone and backhaul networks through sharing and/or public/private collaboration.

In second-tier metropolitan areas, broadband can be provided through mobile, high-capacity microwave, passive optical networks, metro-aggregation optical networks, or IP multi-protocol label switching (MPLS). The third-tier ‘no broadband’ area can often be served (either in isolation or additionally) by satellite providers, particularly under universal service policies. Although fibre backbone infrastructure might be preferred for high urban populations, satellite technology can play an important role in serving remote areas, rural or sparsely populated places where the expansion of terrestrial fibre is unlikely.

Getting the mix right ensures an economical balance to meeting connectivity targets. Service convergence around IP-based technologies can support multiple services, as well as multiple service providers sharing the same network. Such alternatives need to be evaluated case-by-case, taking into account competition and market conditions and cost-benefit analysis, to avoid discouraging investment.

Making as much use as possible of existing passive assets can lower costs and avoid replication of infrastructure. Open application development platforms, content distribution networks (CDNs), and distributed data centres can also help meet the demands and expectations of end users, taking into account long-term needs, broadband goals and target objectives.

In addition to choices of the best technological infrastructure for providing broadband to different markets, operators and service providers must also consider optimal ways of marketing services to end-users. Inspirations for new business models abound; for instance, positive experiences with prepaid telephony in driving growth in the mobile market have encouraged the private sector to explore similar initiatives for broadband.

Importantly, targets need to make specific provision for optimising the user experience. Studies suggest that 7–8 seconds or less is the average tolerance time after which a typical web user may become frustrated and quit.

### FUTURE CHALLENGES

However, there are growing challenges associated with strong growth in broadband and high-speed services, leading some to question whether the industry may fall victim to its own success. The worldwide mobile data market will see a tenfold increase in consumption by 2016, with mobile phone users consuming six-and-a-half times as much video, eight

### WOMEN ARE UNDER-REPRESENTED

According to estimates from the GSMA and Cherie Blair Foundation, women represent nearly two-thirds of the untapped market for mobile growth. Globally, a woman is 21 per cent less likely to own a mobile phone than a man (Featured Insight 19). Closing this gender gap would bring the benefits of mobile phones to an additional 300 million women. Mobile operators looking to lead the market in five years’ time should excel at bringing in new female subscribers.



times as much music, and nearly ten times as much gaming as they did in 2011, according to a May 2012 report by Informa Telecoms and Media. While the mobile data market would normally welcome such dramatic growth in consumption rates, Informa notes that the increase in data traffic will far outstrip revenue growth.



## Satellite

communications can provide broadband internet connectivity at virtually zero marginal cost, once the satellite is deployed and until it reaches capacity constraints. ¶¶

The rapid growth of internet capacity demand is not new – traffic has been continually accelerating since the internet was launched. Even if the strong growth in mobile data traffic is sustained, the majority of data will still have to be transferred over a fixed-line backbone network, making fixed-line backbone and mobile access networks complementary. Technology-based developments such as content distribution networks (CDNs) and new internet exchange points (IXPs) have resulted in some economic efficiencies and have generally proved helpful, where the regulatory environment has been favourable. Continuing to meet the challenge of traffic growth successfully requires policy-makers to promote regulatory certainty and lower barriers to entry.

Accelerating the deployment of optical fibre networks would help to solve the increasing challenge of ensuring the transport capacity of mobile networks. Currently, mobile networks are based on macro and micro cell layers allowing transport capacities of up to 42 Mbit/s per cell. The small cell layer could offer throughput capacities easily exceeding 100 Mbit/s in a radius of about 50–200 metres, assuming they are connected to the network via optical fibre.

### THE SATELLITE CONTRIBUTION

Different technologies offer different advantages, but it is clear that satellite communications offer major potential for deploying ‘universal’ broadband services rapidly to large numbers of people. Satellite broadband can prove its worth in remote areas, rural areas or large, sparsely populated tracts of country. Satellite connections can be deployed rapidly without large investment in terrestrial infrastructure – users only need a satellite antenna and a modem to obtain broadband access. It is also a useful back-up if an undersea fibre connection goes down, although comparative cost issues still persist in some cases.

Despite its capital-intensive nature, the satellite industry maintained steady growth rates throughout the economic slowdown since 2008. This is partly because satellite communications can provide broadband internet connectivity at virtually zero marginal cost, once the satellite is deployed and until it reaches capacity constraints, which has made satellite operators good candidates for stimulus funding in some countries. Some commentators argue that today’s satellite solutions lag behind fibre and wireless technologies in latency, mass throughput, and cost

per delivered bit. Today’s satellite technologies can be very advanced in terms of reliability, speed of deployment, and security, while the next generation will deliver higher transmission speeds competing with other broadband technologies in speed and costs.

**Dr Hamadoun Touré** has been Secretary-General of ITU since January 2007. Re-elected for a second four-year term in October 2010, Dr Touré is committed to ITU’s mission of connecting the world, and to helping achieve the Millennium Development Goals and sustainable development through harnessing the unique potential of Information and Communication Technologies (ICTs).

### The International Telecommunication Union

(ITU) is the UN specialised agency responsible for ICTs. Its membership, comprising 193 governments, some 700 private companies and about 50 universities, has called for ITU to take the lead in engaging the global community in addressing climate change through the use of ICTs. ITU is headquartered in Geneva, Switzerland, with 12 field offices around the world. ITU hosts an annual Global Symposium for Regulators (GSR, at: [www.itu.int/gsr/](http://www.itu.int/gsr/)) at which emerging regulatory issues are debated to evaluate key regulatory trends and forge best practice guidelines to help the global regulatory community in their decision-making.

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# DEVELOPING INTERNET EXCHANGE POINTS IN AFRICA



**Michuki Mwangi** of the **Internet Society** shows how the African Union's **AXIS** initiative is helping build internet exchange points and bring about an effective continental network.

During the last decade, the African internet infrastructure has benefited from gradual and ongoing policy and regulatory changes that have positively impacted regional internet infrastructure growth. Today, Africa is less dependent on satellite connectivity for its main regional and global communications, following major investments made in submarine, terrestrial fibre, mobile and wireless data technologies. As a result, by July 2012, Africa's total inventory of terrestrial fibre reached 732,662 km, with 40 per cent of the population being within 25 km range to a fibre node. At the same time, the total submarine cable capacity grew to 25.5 Tbps and is expected to triple by 2014.

These developments appear to be addressing some of the problems that have contributed to the slow and expensive internet access in the region.

## THE CHALLENGE

Despite the significant growth in regional infrastructure, and an increase in direct physical interconnections between African cities, most local African internet traffic (local-to-local exchange of traffic) travels through Europe and North America and comes back to Africa. This anomaly is attributed to insufficient internet exchange points (IXPs) in the continent. In cases where there is direct interconnection between major cities, it is a clear indication that satellite routing policies are still predominant in

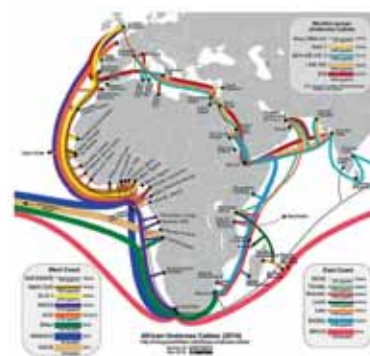


Figure 1. Africa's submarine cable resources (2014)

a submarine cable and terrestrial fibre infrastructure setting. This is a major hindrance for the development of internet in Africa, and one that regional policy-makers and regulators need to address.

	Internet exchange points				Domestic bandwidth production			
	Feb 2012	Feb 2013	Net change	Change %	Feb 2012	Feb 2013	Net change	Change %
Africa	23	24	+1	+4	5.63G	11.9G	+6.24G	+111
Asia-Pacific	74	76	+2	+3	1.32T	1.52T	+202G	+15
Europe	144	149	+5	+3	8.74T	10.6T	+1.87T	+21
Latin America	40	46	+6	+15	115G	193G	+77.8G	+68
North America	86	88	+2	+2	1.26T	1.47T	+210G	+17
Total	367	383	+16	+4	11.4T	13.8T	+2.36T	+17

Table 1. IXPs and data capacity, 2012-13

## Suboptimal routing of cross-border internet and data traffic has negative financial implications.

The effect of the lack of local exchange points is shown by tracing the path followed by an internet data packet from Kigali, Rwanda to Nairobi, Kenya. The data packet from Kigali will go through the terrestrial fibre optic cables that traverse past Nairobi, and use one of the three submarine cables landing at the port city of Mombasa in Kenya to go to Europe. Then it goes back to Nairobi using the same cables. This suboptimal routing of cross-border internet and data traffic has negative financial implications. Independent analysis has shown that Africa pays over US\$600 million to countries with more developed infrastructure every year for intra-country and inter-African traffic exchange that is routed outside the continent.

The cost of sending traffic outside the continent is extremely high, and can be reduced with human and technical infrastructure development. IXPs are one example of the technical infrastructure that can be locally built to lower access costs. Local traffic exchange – ‘keeping local traffic local’ – also increases quality of service and user experience as the data packets have a shorter distance to travel. Cross-border interconnection and IXPs eliminate the reliance on international connectivity for national and regional communications. For instance, outages on submarine cables disrupt national and regional communications if the signal needs to travel overseas.

### THE CRITICAL INFRASTRUCTURE – INTERNET EXCHANGE POINTS

Internet exchange points (IXPs) are a vital part of the internet ecosystem in that they enable two users in different networks to exchange information most efficiently in the broad internet network system. In this way, they are analogous to regional airport hubs – airlines exchange

passengers between their flights in much the same way that networks exchange traffic across an IXP.

## IXPs are one example of the technical infrastructure that can be locally built to lower access costs.

It is therefore common to find content providers, content distribution networks (CDNs), national research and academic networks (NRENs), e-government networks, mobile operators, internet service providers (ISPs) and carrier networks interconnecting at an IXP. The access providers transport the content from the IXP to the consumer. Often the carrier networks resell it through a chain of intermediaries before it arrives at its ultimate user. At present there are over 380 IXPs globally, with more than half

Figure 2. IXPs in Africa



located in Europe and the USA. More information can be found in *Internet Traffic Exchange* by Dennis Weller and Bill Woodcock (OECD, 2013).

### THE IXP BUSINESS MODEL

There are a variety of institutional models that have been adopted to operate IXPs. Of these models, the most common is one in which a non-profit industry association of ISPs operates the IXP. In this model, operating costs are shared among members who pay a one-off joining fee and a monthly, quarterly, or annual operating fee.

Technically, there are two predominant technical models for IXP operation. The simplest model is Layer 3, in which IXPs exchange all traffic between member networks inside a single router. The other model is Layer 2, in which each member provides its own router and traffic is exchanged via a simple ethernet switch.

The requirements for traffic routing agreements between IXP members vary depending on the IXP's institutional model and other local policies. Many IXPs apply a mandatory multilateral peering agreement (MMLPA), in which anyone who connects with the IXP must peer with everyone else who is connected. Others require each network to enter into bilateral peering (BLP) arrangements with the other network members. Both policies have advantages and disadvantages. What is critical for the success of the IXP in either case, as pointed out by Mike Jensen in *Internet Society News*, is that the members participate in the policy formulation process.

### THE AFRICAN UNION AXIS PROGRAMME

The Internet Society has provided technical training in Africa since the early 1990s. Our principle focus is to improve

“Many IXPs apply a mandatory multilateral peering agreement.”

interconnection and traffic exchange within the continent through the implementation of IXPs, network training and capacity building. The network of experts and experience in building internet infrastructure and provision of technical training has increased dramatically through the efforts of the Internet Society, AfriNIC, the African Union, and countless internet community experts working together to provide training to increase human and technical capacity development.

Recently, the African Union awarded the Internet Society a



contract to deliver community mobilisation (best practices) and technical aspects workshops (hands-on) to support the establishment of internet exchange points (IXPs) in 30 AU member states as part of Phase I of the African Internet Exchange System (AXIS) project. The AXIS project aims to keep Africa's internet traffic local to the continent by providing capacity building and technical assistance to facilitate the establishment of IXPs in Africa. The project is funded by the Euro-Africa Infrastructure Fund and the Government of Luxembourg.

“The workshops lay the groundwork for establishing a local IXP, and are held over a three-day period.”

The delivery of the AXIS workshops is being spread over three years with ten workshops in 2012, 14–19 workshops in 2013, and 6–11 workshops in 2014. These were all delivered with local partners. A local host is identified to assist with the workshops, and provides support and facilities for the consultants and project coordinators. This may include help with airport transfers, hotels and visas.

Training is broken down into two phases: best practice capacity building and technical aspects workshops. Best practice capacity building is designed to create awareness, build capacity, and impart knowledge on the value and benefits of establishing a local IXP for the local internet ecosystem.

The workshops lay the groundwork for establishing a local IXP, and are held over a three-day period. The target attendees are ‘C-level’ executives, decision-makers and business development managers of organisations that operate access networks and provide interconnection and content delivery networks. For example:

- Internet service providers (ISPs)
- Mobile operators
- National research and education networks (NRENs)
- Content distribution network (CDNs)
- Hosting solutions providers
- Country-code top-level domains (ccTLDs)
- Data center operators
- Government network operators
- Regulators and ministries.

These organisations would bring value to an IXP, and are considered potential stakeholders.

Technical Aspects workshops are being organised in the 30 AU target countries. They will follow Best Practices workshops, after a reasonable consensus is reached among stakeholders to establish an IXP. A Technical Aspects workshop will teach the technical and administrative skills needed to set up, operate and administer an IXP, and will last five consecutive days. The number of participants will generally range from 20 to 30 per workshop. To date, workshops have been taught by one lead facilitator and one assistant. Assistants are selected locally. The participants of the workshops will be network operators and other technical experts who will be directly or indirectly involved in participating in or operating the future IXP. In 2012, Best Practices workshops were held in Burkina Faso, Senegal, Burundi, The Gambia, Namibia, Republic of Guinea and Niger.

**Michuki Mwangi** joined ISOC in April 2008 as Senior Education Manager working with the Education team to promote Internet growth and sustainability in the developing world. Michuki has long been active in the African and global Internet communities, having been centrally involved in key infrastructure developments, technical coordination activities, and policy-making forums. Before joining ISOC, Michuki was an Internet technology consultant. He previously served as the Administrative Manager at the .KE registry (KENIC) and serves as president of the African Top Level Domain (AfTLD) Association and Chief Technology Officer (CTO) of the Kenya Internet Exchange Point (KIXP), both in a volunteer capacity.

**The Internet Society** is the trusted independent source for internet information and thought leadership from around the world. With its principled vision and substantial technological foundation, the Internet Society promotes open dialogue on internet policy, technology, and future development among users, companies, governments and other organisations. Working with its members and chapters around the world, the Society enables the continued evolution and growth of the internet for everyone.

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