**Overview of energy in Africa**

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1. **Introduction**

Africa currently has the lowest per capita usage electricity usage of any region in the world. Lack of access is particularly stark in the rural areas, with only 10% of rural dwellers having access. Most electricity is provided by state-owned utilities, although many of these utilities have, over the years, been broken up, and commercialized, and some have been privatised. Most electricity production in Africa relies on large hydropower systems or fossil fuels, including gas-fired power stations operated by private ‘independent power producers’ under long-term contracts. Diesel generators are increasingly used, both to provide a ‘temporary’ increase in power supply to the grids, and by businesses and some households who are not connected to the grid. Selling these generators is also a growth business for some multinationals.

At the same time, Africa is rich in sources of renewable energy – including wind, hydro- and solar power. There are various initiatives underway in Africa to tap into renewable energy. Some of these are state-led initiatives, albeit with private sector partners, while others are smaller, more community based initiatives, but some are extremely large projects led by multinational companies*.*

This report sets out a broad overview of energy provision in Africa, focusing specifically on the role of the public sector, while also mapping out the multiple roles of the private sector. One of the key themes of the report will be to focus on the development of renewable energy as a viable source of energy.

The report builds on previous PSIRU reports on energy provision in Africa, which can be found at [www.psiru.org](http://www.psiru.org) .

1. **Access to electricity in Africa**

Access to electricity is a key ingredient for reducing poverty and inequalities in Africa. With this access, hospitals can store vaccines and medications at hospitals, with the result that health is improved; households can store food at home so they can buy more cheaply in bigger bulk, and less time is spent in daily shopping; people can read and study at night, so improving overall literacy and school completion rates; transport and telecommunications services are improved; it can be used for ensuring clean water and sanitation services; and it allows for cooking without gathering biomass and polluting indoor air. In other words, electricity plays a vital role in meeting development needs.

Without electricity, which is orientated to meet the needs of communities rather than big business, development in countries is severely restricted. As the Human Development Report 2012 points out, while Africa has seen substantial economic growth over the past decade, this has not translated into, for instance, food security.[[1]](#endnote-1) In other words, economic growth is not enough, it must be economic growth that is orientated to meeting the needs of people/communities.

Historically, the public sector has been responsible for providing electricity in African countries. This shifted in the 1980s as international bodies such as the IMF and World Bank started pushing many African countries to adopt neoliberal policies under the banner of structural adjustment programmes. Often the involvement of the private sector has been, implicitly or explicitly, a condition of funds given by donors to various governments in Africa.

However, privatisation did not deliver, and today it is still mainly the state that provides electricity across the continent. In many cases, though, the electricity utilities have been broken up and commercialized, which has impacted on their ability to meet their country’s needs.

Today, electricity provision across the continent faces serious challenges – access to electricity is low, and the amount of electricity being generated, reliably and consistently, is too low to meet rising demand.

* 1. **Low access to electricity**

Only 28% of Africa’s population, excluding South Africa, have access to electricity through the grid.[[2]](#endnote-2) Another way of looking at it is to say that 587 million people in the whole of Africa lack access to electricity, 585 million of whom are in Sub-Saharan Africa.[[3]](#endnote-3) There are strong regional disparities in access to electricity. 2009 figures show that North Africa is faring better than sub-Sahara Africa, with an electrification rate of 99%, compared to 30.5% for Sub-Saharan Africa.[[4]](#endnote-4)

|  |
| --- |
| Table 1: Electricity access in 2009 - Regional aggregates |
|   | Population without electricity million | Electrification rate% | Urbanelectrification rate% | Ruralelectrification rate% |
| **Africa** | **587** | **41.9** | **68.9** | **25.0** |
|    North Africa | 2 | 99.0 | 99.6 | 98.4 |
|    Sub-Saharan Africa | 585 | 30.5 | 59.9 | 14.3 |
| **Developing Asia** | **799** | **78.1** | **93.9** | **68.8** |
|    China & East Asia | 186 | 90.8 | 96.4 | 86.5 |
|    South Asia | 612 | 62.2 | 89.1 | 51.2 |
|    Latin America | 31 | 93.4 | 98.8 | 74.0 |
|    Middle East | 22 | 89.5 | 98.6 | 72.2 |
| **Developing countries** | **1,438** | **73.0** | **90.7** | **60.2** |
| **Transition economies & OECD** | **3** | **99.8** | **100.0** | **99.5** |
| **World** | **1,441** | **78.9** | **93.6** | **65.1** |

Source: WEO 2010

Table reproduced from <http://www.iea.org/weo/electricity.asp>

Coverage is particularly low in the rural areas. Household access in the rural areas is about 14.3% for sub-Saharan Africa, compared to 59.9% in the urban areas.[[5]](#endnote-5) It is estimated that about 41% of the population lives in areas that that are far from the electricity grid, making it difficult to connect these areas to the electricity grid in the near future.[[6]](#endnote-6) There is thus a dire need for extensions of the system to households; as well as extensions that allow for economic growth and industrial development.

The pattern in Southern Africa reflects the sub-Saharan pattern. Even in countries with relatively high electrification rates, access in rural areas is generally very low. For example, in Botswana, while the electrification rate is 47%, there are many rural areas that remain unconnected. In Swaziland, the estimated electrification rate is 27%, with an estimated 40% of urban areas electrified and 4% of rural areas. In Malawi, electrification rates are low at 7%, with about 25% of urban households having access and only about 1% of rural households. This is similar to Lesotho where about 11% of households have access to electricity, with only 1% access in rural areas.[[7]](#endnote-7) The DRC has an estimated electrification rate of 6% -with access of 35% in urban areas and 1% in rural areas.[[8]](#endnote-8)

* 1. **Insufficient generation capacity**

There is insufficient power being generated to meet Africa’s needs, with the region’s power generation lower than any other region in the world. 48 countries in Sub-Saharan Africa produce 68 gigawatts of electricity – which is as much as Spain produces. And the situation is not getting better - capacity growth has stagnated.[[9]](#endnote-9)

Even in North Africa, where access to electricity is high, there is an increasing demand for electricity, which governments are struggling to meet.

Many countries in Southern Africa import electricity from other countries to meet their energy needs. This puts them in a vulnerable position when the exporting country starts experiencing power shortages as well. For instance, with Botswana importing about 80% of its electricity from Eskom (2008 figures), Botswana was hard hit in 2007/2008 when Eskom itself experienced power shortages. Lesotho and Swaziland are almost totally dependent on the power imported from South Africa.

The next section will highlight a number of country case studies, focusing on who the key actors in the electricity sector are – public or private; and specific developments in that country.

* 1. **Power outages**

It is clear that power shortages and power outages are a frequent and pervasive fact of life in many African countries. Currently, at least 30 countries across Africa are affected.[[10]](#endnote-10)

The table below gives information on outages for specific countries.

**Blackout data for selected countries:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Outages (days/year)* | *Average duration (hours)* | *Outages (hours per year)* | *Down time (% of year)* | *Suppressed demand in 2005 (GWh)* |
| ***Southern African Power Pool*** |
| Angola | 92 | 19.31 | 1,780.8 | 20.3 | 435 |
| Congo, Dem. Rep. | 182 | 3.63 | 659.2 | 7.5 | 351 |
| South Africa | 6 | 4.15 | 24.5 | 0.3 | 602 |
| Zambia | 40 | 5.48 | 219.9 | 2.5 | 157 |
| ***East African/Nile Basin Power Pool*** |
| Kenya | 86 | 8.20 | 702.6 | 8.0 | 366 |
| Tanzania | 67 | 6.46 | 435.9 | 5.0 | 208 |
| Uganda | 71 | 6.55 | 463.8 | 5.3 | 84 |
| ***Western African Power Pool*** |
| Cote d’Ivoire | 46 | 5.94 | 1,101 | 13 | 365 |
| Ghana | 61 | 12.59 | 1,465 | 17 | 979 |
| Nigeria | 46 | 5.94 | 1,101 | 64 | 10,803 |
| Senegal | 44 | 5.67 | 1,052 | 17 | 250 |
| Sierra Leone | 46 | 5.94 | 1,101 | 82 | 189 |
| ***Central African Power Pool*** |
| Cameroon | 26 | 4.03 | 613 | 7.0 | 241 |
| Congo, Rep. | 39 | 4.33 | 924 | 10.6 | 616 |
| Gabon | 40 | 5.20 | 950 | 10.8 | 134 |

Source: Table reproduced from Eberhard, A; Rosnes, O et al (2011) pg. 56

The reasons for these power outages vary.

* Sometimes the reason is aging equipment/plants and a lack of maintenance. This, for example, is the problem in Senegal.
* In recent years the problem in countries like Tanzania and DRC, which rely heavily on hydroelectric power, has been falling water levels in the major hydroelectric dams, caused by drought. It is said that East Africa is experiencing its worst drought in 60 years.
* Drought is not the only problem to affect DRC however. It is also suggested that poor management has played a role – hence the decision of President Joseph Kabila to suspend the board of SNEL, the state-owned entity responsible for electricity generation and supply, in August 2011.[[11]](#endnote-11) Other reasons given for the low generation of electricity are the age of the installations and the absence of a second power line between Inga and Kinshasa.[[12]](#endnote-12)
* In some countries, such as Angola and DRC, war has damaged infrastructure, and has had a long-term impact on the country’s ability to generate, transmit and distribute electricity.
* Energy demand is outstripping the supply of energy. This, for instance, is the problem in South Africa.

Power outages in a number of countries have resulted in social protests.

* For instance, in Senegal, Senelec (Senegal National Electricity Co), the state owned electricity company, has been unable to meet electricity demand, largely because of aging infrastructure and insufficient funds to buy the diesel and gas used to generate electricity. This has resulted in frequent power cuts, which have led to ongoing protests, the latest taking place in June 2011.[[13]](#endnote-13)
* Similarly, in Niger, demonstrations against ongoing power cuts took place in Tanout at the beginning of August 2011. According to Nigelec, the Niger Electricity Company, disruptions in Nigeria, which is the source of about 80% of Niger’s power, are the cause of the power outages in Niger. In the past, Niger has taken measures to cut its reliance on Nigeria for electricity, but these have not solved the problem. These measures included buying eight new diesel-powered generators in 2008, one for each of its regions.[[14]](#endnote-14)
	1. **Rural electrification**

Access to electricity is extremely low in rural areas across Africa. Many people and households make use of traditional biomass sources.

Many people argue that the way forward for rural electrification is through off-grid renewable energy sources such as small wind projects, solar power and micro-hydro projects. This is a position being pushed by the World Bank on the one hand, as well as by many environmental groupings and NGOs and CBOs on the other hand.

There is also an argument that instead of the national grid growing from the top down, it is possible to grow it from the bottom up. So for instance, households equipped with small scale solar or wind projects, can be linked into microgrids in neighbourhoods which allows for sharing of any excess electricity generated. Microgrids can then be linked to community wide grids, which can be linked to municipal wide grids, and eventually these can be linked to the national grid.

With access to electricity very low in rural areas in many countries, governments have set up rural electrification agencies or bodies to extend access in these areas.

1. **Country case-studies**

This section looks at three country case-studies – Kenya, Tanzania and Nigeria. These case studies serve to show the specificities of the energy sector in particular countries spread across the continent, but they also help to highlight common themes and issues in the energy sector across the continent as a whole. Section 4 will tease out these common themes.

* 1. **Kenya:**

Kenya has low levels of electricity access in the country, with the urban electrification level at 51%, and that of the rural areas at 4%.[[15]](#endnote-15) Overall, in 2011, 28, 9% of the population were connected to electricity.[[16]](#endnote-16)

The state remains the dominant player in the electricity sector, although there are 6 IPPs which generate about 24% of the country’s electricity. Over the years there has been considerable restructuring in the energy sector, much of it carried out under pressure from foreign donors.

The Kenya Power and Lighting Company, a state utility, was split, in 1997, into the Kenya Electricity Generating Company (KenGen), which took over the publicly owned power plants, and Kenya Power and Lighting Company KPLC (which continued to deal with transmission and distribution). Further unbundling took place in 2008 when the Kenya Electricity Transmission Company (KETRACO) was established to focus on the development of the national electricity transmission grid network. While KETRACO is wholly owned by the government, both KPLC and KenGen have private shareholders.

Initially, after the restructuring, KPLC, registered on the Nairobi stock exchange, was not majority owned by the government. This made it difficult for the utility to raise finances for its capital intensive projects because financiers were reluctant to lend money without the implicit credit guarantee provided by government owned entities. KPLC was restructured in late 2010, and is now 50.1% owned by the government. This has opened up more financing options for the entity, which plans to spend Sh45 billion over the next five years on capital expenditure, much of which will be borrowed. One of the first loans under this plan is a Sh5 billion loan from the World Bank to be disbursed through the IFC. These funds will be used to maintain transmission lines, improve quality, reduce losses and maintain 38 off-grid power generators in rural areas.[[17]](#endnote-17)

For two years, from 2006 to 2008, it was under a management contract with Manitoba Hydro International, a Canadian company. The World Bank insisted on KPLC bringing in a private company on a management contract as a condition for financial assistance in upgrading KPLC’s distribution network.

While the management contract ended in 2008, KPLC and Manitoba have now signed a memorandum of understanding (MOU) to cooperate in exploring and bidding for electricity business opportunities in Africa.

KenGen is 70% state owned, and 30% private shareholding. It listed on the Nairobi stock exchange in 2006. It generates 76% of the electricity.

There are also a number of Independent Power Producers operating in the country, who produce about 24% of the country’s electricity.[[18]](#endnote-18) These are:

* Iberafrica Power (EA) Company Ltd – a thermal power plant
* Tsavo Power Company Ltd – a thermal power plant
* Orpower 4 Inc – a geothermal power plant
* Rabai Power Company Ltd – a thermal power plant
* Imenti Tea Factory Company – a mini-hydro
* Mumias Sugar Company Ltd – a co-generation plant. With sugar processing, both heat and power are produced, and the company is able to export surplus power to the national grid. Currently this plant exports 26MW to the national grid.

The main sources of electricity generation are renewable with hydroelectric power the biggest (46.9%), followed by geothermal (19.9%). Fossil fuels generate 31.3% of electricity annually.[[19]](#endnote-19)

Peak demand in 2010/2011 was 1 194 MW. Total installed electricity capacity is about 1 414 MW.[[20]](#endnote-20) However, according to Eddy Njoroge, the managing director of KenGen, because of the problems with hydropower, the effective capacity is only about 1 100MW.[[21]](#endnote-21) The country faces frequent power outages, and is not able to generate enough electricity to meet rapidly rising demand. A major cause of the power outages are ongoing problems of drought, deforestation and the silting of dams, which affects its ability to generate sufficient power from hydro-electricity, which is the country’s main source of energy (accounting for 60% of power generation). Other problems include aging infrastructure, and cable theft.

Despite the frequent outages, KPLC posted an increase in profit of 13.5% for the 2010/2011 financial year. This increased profit resulted from the increasing demand for electricity.[[22]](#endnote-22)

In order to deal with the situation, Kenya makes use of expensive temporary diesel-based power, which has been in place since 2006, and has a very high wholesale tariff. It also imports electricity from neighbouring countries to try and meet its need. In addition, it has implemented power rationing from time to time. For instance, this happened between 1999 and 2001, and more recently, from July to August 2011.[[23]](#endnote-23)

COTU, the Central Organization of Trade Unions, has called for KenGen and KPLC to be merged, arguing that a merged electricity parastatal would be better able to meet the challenges facing the electricity sector in the country, such as the frequent power cuts experienced.[[24]](#endnote-24)

Electricity users are made to carry the risks involved in electricity generation in that the tariff is adjusted according to fuel costs and forex adjustments. While this benefits electricity payers at times, it can also be extremely detrimental to households when, for instance, drought results in more fuel being used to generate electricity.[[25]](#endnote-25) Between January and October 2011, electricity prices had increased by about 55% because of rising fuel costs and forex adjustments.[[26]](#endnote-26) While the electricity tariff fell again in January 2012, because of heavy rains and a strengthening shilling, by March, the fuel cost segment of the bill increased again, causing the electricity tariff to rise once again.[[27]](#endnote-27)

The World Bank applauds the fact that electricity consumers are burdened with paying for fuel costs and exchange rate fluctuations, arguing that “electricity suppliers are thus protected from fuel market risk”, allowing for greater sector sustainability. The Bank also notes that tariffs are higher in Kenya compared to other countries, “reflecting the fact that in Kenya prices are close to or at cost recovery levels”.[[28]](#endnote-28)

The vision for the future of the energy sector in Kenya is contained in the government document “Kenya Vision 2030”, adopted in 2008 – which sets out a long-term developmental blueprint for the country. The new constitution, introduced in terms of Vision 30, was promulgated in 2010, and will result in considerable devolution of governance to 47 counties. It has meant that all the different sectors need to be reviewed to make sure they align with the new constitution. As a result of this, the Department of Energy has produced a new National Energy Policy, which is currently being debated within the country.[[29]](#endnote-29) The legislation which currently governs the energy sector is the Energy Act of 2006, which encouraged private sector participation in the development of the sector.

 In terms of Vision 2030, and the draft National Energy Policy, Kenya needs to increase national power generation to 19 199 MW by 2030. The aim is to have, by 2030, 26% of installed capacity obtained from geothermal sources, 19% from nuclear sources, 13% from coal, 5% from hydro, 9% from thermal plants (MSD), 11% from gas turbines (LNG), and 9% from wind plants. This reflects a serious intention to shift away from Kenya’s current dependence on hydroelectric power and tap into geothermal power more intensively.

Geothermal is an important source of energy for Kenya – in the Great Rift Valley there is a proven potential of 7 000MW. Currently Kenya has an installed capacity of 198 MW. Three sites in the Great Rift Valley, Olkaria I, II and III are operated by KenGen. Olkaria III is operated as an IPP, by Orpower 4.

The Japanese International Cooperation Agency and Kenya recently signed a Sh32.6 billion loan agreement for the further development of the KenGen power plants.[[30]](#endnote-30)

One of the ways the government intends to tap geothermal sources more comprehensively is to offer incentives to private sector companies to get involved in geothermal generation. It is also planning to lower the risks associated with drilling geothermal wells by having the Geothermal Development Company (GDC), a public company, set up to help develop geothermal energy resources, drill wells and absorb some of the costs that private companies would otherwise have to bear.[[31]](#endnote-31)

The first geothermal project to be launched by GDC was the Menengai Geothermal Project launched in April 2012. The African Development Bank is providing funding for the first phase of this project. By 2016 it is envisaged that this phase will generate 400MW, which is 25% of the current consumption in the country. By 2030, when phase three is implemented, it will have the capacity to produce 1 600MW of electricity.[[32]](#endnote-32)

Another major renewable energy project is the Lake Turkana Wind Power project, for which construction will begin in June 2012. It is expected to generate 300MW when it is commissioned in 2014 and will be the largest wind farm in sub-Sahara Africa. It is a private sector initiative, with the Lake Turkana Wind Power Project (LTWP) Consortium responsible for financing, constructing and operating the wind farm. The consortium has signed a Power Purchase Agreement with KPLC and the power will be bought at a fixed price. The consortium is made up of KP&P Africa B.V., Aldwych International, Industrial Development Corporation of South Africa (IDC), Industrial Fund for Developing Countries (IFU) and Norwegian Investment Fund for Developing Countries (Norfund).[[33]](#endnote-33) Once commissioned it will become the 7th IPP operating in Kenya.

Despite these renewable energy plans, and the intention, articulated in the draft National Energy Policy to generate at least 70% of electricity from clean or renewable sources, KenGen is still planning to build a new gas-fired power plant, which will run on liquefied natural gas (LNG), at a cost of $686 million. They plan to structure it as a public-private partnership.[[34]](#endnote-34) KenGen is also planning to enter into a joint venture to design, finance, erect, commission and operate a 600MW coal power plant.

Kenya is also planning to continue to explore the implementation of a nuclear electricity generation programme.

The World Bank is very active in Kenya, funding, through various mechanisms, a large number of projects. In the energy sector it has loaned money to KPLC for maintaining, upgrading and developing transmission and distribution infrastructure; and to Kengen for developing further generating potential, particularly geothermal energy. The most recent loans include:

* A Sh 8.5 billion World Bank loan to establish sub-stations in various areas, granted in 2012. Using these funds, KPLC contracted two Indian firms, KEC International and Siemens Limited of India to construct various sub-stations around the country.[[35]](#endnote-35)
* Sh38 million from World Bank to fund installation of electricity power in Huruma and Maina slums in Olkalou and Nyahururu towns.[[36]](#endnote-36)

It has also given money to support private sector power generation projects. This support is happening in the context of Kenya struggling to attract further IPPs. In February 2012, it approved US$166 million in partial risk guarantees for four IPP projects.[[37]](#endnote-37) Three of these projects, Thika, Truimph and Gulf, will be diesel (thermal), while one, Olkaria III will be geothermal. The intention is for each of the IPPs to have a 20-year Power Purchase Agreement with KPLC.

The African Development Bank also finances a number of energy projects in Kenya. For example:

* $71.45 million loan from the African Development Bank for a power transmission system improvement project, granted in 2010.
* Funding from AfDB for the first phase of the Menengai Geothermal Project.

Additional information on the energy sector in Kenya can be found in two previous PSIRU reports, “Energy privatisation and reform in East Africa” (<http://www.psiru.org/reports/energy-privatisation-and-reform-east-africa>) and “Electrifying Africa: Power through the public sector” (<http://www.psiru.org/publications> ).

* 1. **Tanzania:**

TANESCO, the Tanzanian Electric Supply Company Limited, is an entirely state-owned utility, which is vertically integrated. Initially, the government planned to privatise Tanesco, under pressure from the World Bank, but in 2006 this was rejected by the government. In the meantime, Tanesco entered into a management contract with Net Solutions, a South African company. Under pressure from the World Bank, the contract was renewed in 2004, but the government was not happy with the contract, and did not renew it in 2008.

While full privatisation thus did not take place, the Electricity Act of 2008 did liberalise electricity generation, transmission and distribution, and opened up the way for IPPs to compete with Tanesco in generating electricity.

There are currently two IPPs in Tanzania:

* Songas Plant, which is a 110MW gas-fired plant, originally owned by AES and taken over by Globeleq in November 2002.
* Tegeta in Dar-es-Salaam, which is a 100 MW diesel-fired plant, owned by Independent Power Tanzania (IPTL), which is majority owned by the Malaysian company, Mechmar. IPTL has not been generating much electricity because of a dispute over the price of power that they would supply.[[38]](#endnote-38) At times, when electricity shortage is severe, the government has been forced to buy fuel to move the turbines, so allowing IPTL to produce electricity.

Together, these IPPs cost Tanesco about 90% of its revenue .[[39]](#endnote-39) As the Controller and Auditor General’s annual report for the 2007/2008 financial year notes: “Tanesco is overburdened by the liabilities imposed by various power purchase agreements (PPA) mostly entered without compliance with the requirements of Public Procurement Act and its regulations”.[[40]](#endnote-40)

Tanzania has an installed electricity capacity of 943 MW (in 2007). Hydro generates about 91% of this capacity, while thermal generates about 9%. Households, particularly rural households also consume large amounts of biomass for heating, lighting and cooking.[[41]](#endnote-41)

Access is low, with 39% of urban people having access to electricity and 2% of rural people having access. In total, about 18,4 % of the population have access to electricity. The national grid largely runs from East to West through the country, with the result that large sections of the North and South of the country don’t have easy access to the grid. The government has an ambitious target to have 30% of the population with access to electricity within the next two years, but recognizes the difficulties of achieving this. One of the ways that they envisage it happening, however, is through public-private partnerships.[[42]](#endnote-42)

Like Kenya, Tanzania has experienced crippling power shortages since the early 1980s, in part due to drought and its impact on hydroelectric power. At high cost, Tanzania has entered into a number of Emergency Power Purchase Agreements, which allow Tanzania to establish Power Off-Take Agreements (POAs) with private sector energy generators who sell the energy they produce to TANESCO.

Not only are these agreements expensive and environmentally damaging (they rely on diesel), but they are susceptible to corruption as experience in Tanzania has shown.

In 2006 Tanzania signed a short-term power agreement with a company called Richmond Development Corporation. Because of Richmond’s failure to supply the electricity it was contracted for, a parliamentary committee was set up to investigate the agreement and the company’s failure to implement it. The committee found that Richmond had neither the experience, nor the expertise, to deliver on the short-term agreement, and was in addition, financially incapacitated. It was argued that there was political interference from the government to make Tanesco sign the agreement with Richmond rather than any other company.

As a result of the political fallout from this investigation, Edward Lowassa, the Prime Minister of Tanzania, as well as Cabinet ministers Nazir Karamagi (Energy and Minerals Minister) and Dr Ibrahim Msabaha (East Africa Cooperation Minister, who was the Energy and Minerals Minister at the time when the contract was signed), resigned from government in 2008. This forced the President, Jakaya Kikwete, to dissolve the cabinet and form a new government.

Towards the end of 2008 the government, partly responding to public pressure, announced that it was cancelling the contract. By now Richmond had passed the contract on to another company, Dowans Holdings. Dowans then took Tanesco to the International Chamber of Commerce (ICC) for breach of contract. In its 15 November 2010 ruling the ICC co-arbitrators found in Dowans favour. The ruling states that “It is declared that Tanzania Electric Supply Company Limited was in repudiatory breach of the POA and that Dowans Tanzania Limited was entitled to and did validly terminate it”. The ICC arbitration tribunal ordered Tanesco to pay $123.6 million (about Sh185.5 billion) to Dowans in settlement of its claim.

It is ironic that Tanesco, in attempting to deal with the alleged corruption in the first place, lands up in the ICC, and is penalised with a hefty fine. There has been strong opposition to Tanesco paying the fine in Tanzania from trade unions and other civil society organisations. Tanesco has attempted to challenge the ruling in the Tanzanian High Court but has not been successful so far.

Meanwhile, the Dowans plant in Tanzania has been sold to a USA-registered company, Symbion Power. Symbion Power now has an agreement with Tanesco to supply short-term emergency power. Tanesco also has an agreement with Aggreko Plc to produce 100 MW using diesel.

Partly as a result of the high cost of bringing in short-term emergency power, Tanesco is in a financially difficult situation, and made a Sh200 billion loss last year. To try and solve this problem it has:

* sought to borrow Sh408 billion from local banks
* increased the tariff by 40.29%, although it had asked the energy regulator for a 155% increase.[[43]](#endnote-43)

In July 2012, this emergency tariff was extended for another three months.

The money borrowed from the banks would be used to pay for fuel used to generate electricity until December 2011, and offset charges demanded by power generators when their plants were not running at full capacity.[[44]](#endnote-44)

Some argue that the finances of Tanesco are in such bad shape because of certain officials within the organisation enriching themselves.[[45]](#endnote-45) Emerging out of the parliamentary debate on the Ministry of Energy and Minerals 2012-13 budget estimates are allegations of embezzlement of public funds by Tanesco officials. Four officials, the Managing Director, Deputy Director (Corporate Services), Chief Financial Officer, and Senior Manager (Procurement) have now been suspended in order to allow allegations against them to be investigated.[[46]](#endnote-46)

Tanesco plans to build new generating plants – a 100M gas-fired plant in Dar es Salaam, a 70MW plant fired by heavy fuel oil in Mwanza, and a 70MW plant in the northern region of Tanga.

Additional information on the energy sector in Tanzania can be found in two previous PSIRU reports, “Energy privatisation and reform in East Africa” (<http://www.psiru.org/reports/energy-privatisation-and-reform-east-africa>) and “Electrifying Africa: Power through the public sector” (<http://www.psiru.org/publications> ). A more detailed discussion of the alleged corruption involving Richmond/Dowans can be found at <http://www.psiru.org/reports/tanzania-corruption-energy-sector> .

* 1. **Nigeria**

Nigeria has about 8 000 MW of installed electricity capacity, but, according to the Minister of Power, can only generate 4 000 MW because of infrastructural problems.[[47]](#endnote-47) 33% of the electricity is generated from hydropower and 67% from thermal. Approximately 40% of urban areas have access to electricity, and 10% of rural areas. Demand for electricity far outstrips supply, and many homes and businesses have their own generators making Nigeria one of the largest markets for individual generators. The country is faced with frequent power outages, and there is a high rate of transmission losses. Some of the reasons for the problems in generation include a shortage of gas (a 12-month gas supply emergency plan was announced by the government on 18 April 2012), lack of funding, obsolete equipment and transmission line redundancy. [[48]](#endnote-48)

 In terms of the 2003 National Energy Policy, the aim is ensure that 75% of the population have access to reliable electricity by 2020. This means generating 40 000 MW a year. Government’s estimate of the investment required to ensure a reliable, uninterrupted supply in the country varies from $50 billion (according to the Minister of Power in October 2011), to $ 100 billion (according to the Minister of Power in March 2012), to $500 billion according to NERC in June 2012.[[49]](#endnote-49) The government has made it clear that it expects this funding to come from the private sector and other sources, rather than from government sources.

The electricity sector has been undergoing major reforms since the promulgation of the Electric Power Sector Reform Act of 2005, which liberalized the electricity sector and opened it up for privatisation. This Act was developed with the assistance of the World Bank. As a result of this Act, the Power Holding Company of Nigeria (PHCN) was formed. It took over the assets of the National Electric Power Authority (NEPA) and is 100% owned by federal government. A process of unbundling PHCN into 18 business units was also undertaken. Each of these 18 business units - 7 dealing with generation, 1 transmission and 11 distribution – was set up with its own management, and without being dependent on government funding. The idea was to make each company more efficient, and to prepare it for eventual privatisation.

On August 26 2010, President Goodluck Jonathan released a roadmap on the power sector reforms which set out the steps to be followed to achieve the reforms identified in the Act. The roadmap confirmed:

* The government’s intention to privatise the successor companies to PHCN.
* The launch of the Multi-Year Tariff Order (MYTO) tariff model, which will phase in cost-reflective electricity tariffs.
* The establishment of a bulk electricity purchasing company which will mitigate the risk for private sector companies coming into the sector.
* The establishment of the National Electricity Liabilities Management Company (NELMCO) that will take over PHCN’s stranded assets and liabilities.
* Market rules for operators in the sector.[[50]](#endnote-50)

All of the PHCN business units, apart from the Transmission Company of Nigeria (TCN), are now being privatised through sales, management contracts and concessions. However, the privatisation process, dealt with by the Bureau for Public Enterprises (BPE) has taken much longer than the government expected, not least because of trade union opposition to the process. The bidding process for the generation and distribution companies is only reaching conclusion now. The successful bidders for the generation companies were announced in September 2012. And according to the BPE, the successful bidders for the distribution companies will be announced in October 2012. A Canadian company, Manitoba Hydro, was the successful tenderer for the transmission company management contract.

The table below shows the successful companies for the generation companies (Gencos).

|  |  |  |  |
| --- | --- | --- | --- |
| **Power plant** | **% sold** | **Consortium** | **Companies/individuals involved** |
| Geregu Power Plc (thermal) | Selling 51% | Amperion Power Distribution Limited | BSG Resource Limited (Israel)State Grid Corporation of China (China)Forte Oil Plc (Nigeria) |
| Sapele Power Plc (thermal) | Selling 100% | Chinese Nigeria Power ConsortiumCMEC/Eurafric Energy Ltd | China Machinery Engineering Corporation (CMEC)Eurafric Energy (Nigeria) |
| Ughelli Power Plc (thermal) | Selling 100% | Transcorp | Symbion Power (USA); Transnational Company of Nigeria (Nigeria)Wood RockMedeaThomasen PSL  |
| Shiroro Power Plc (hydro) | Concession for 15 years | North-South Power | XS Energy LtdBP Investment LtdUrban Shelter LtdTransatlantic Development and Investment Co.China International Water ElectricChina Three Gorges CorporationNiger state governmentRoads Nigeria Plc |
| Kainji Power Plc (hydro) (bundled with Jebba hydro power plant) | Concession for 15 years | Mainstream Energy Solutions Limited | RusHydro InternationalRusHydro JSC (Russia)Amni International Petroleum Development C LtdNIGLECAqua EnergyConfluence Cable Network LtdTAKAnchorage Holdings, Nigeria |
| Afam power plant |  | No company qualified  |  |

A major trend that can be identified with all the successful bidders is the linking up of national capital with international capital. Many of the Nigerian companies were set up a few years ago when the PHCN privatisation process started to take advantage of the opening up of the sector.

Some of the problems raised with the privatisation process range from clear rejections of the process of privatisation and what it will mean for the access to electricity of ordinary people in Nigeria, to specific criticisms of particular aspects of the process. These include:

* Some of the information supplied by the government in the RFPs is misleading, faulty and unrealistic. This then gives the private companies an out when they can’t reach their targets – they can blame the government.
* It has been set up so that the bulk buyer of the electricity from the generator firms will bear the financial risk rather than the distribution companies. This opens up the way for the private companies to claim they can’t make a profit, and then the bulk buyer must carry the risk.[[51]](#endnote-51)
* The trade unions have raised problems relating to workers’ rights, conditions of work and benefits.
* Tariffs are being increased so that the sector will become more attractive to private investors. This impacts heavily on the working classes in Nigeria.[[52]](#endnote-52)
* Experience has shown that privatisation goes hand in hand with corruption. Already the Minister of Power, Barth Nnaji, has been forced to resign from government because of a conflict of interest between his position, and the involvement of his energy company in putting in bids.
* The private sector fails to provide the investments that are required.

The process of liberalizing the electricity sector has also involved:

* Installing prepayment meters. Although this is seen as a way of ensuring fair and accurate billing, the lack of which is a major problem in the country, there are many problems associated with these meters. Among the problems is that it forces electricity consumers to pay up-front for electricity.
* Increasing the tariff paid by consumers in order to attract private investors by guaranteeing them a return on investment, and making the price of electricity more predictable. This is done in terms of a Multi-Year Tariff Order (MYTO), which includes ensuring that the tariff is cost-reflective.[[53]](#endnote-53)

There have been complaints about the less than transparent billing system used by PHCN, which charges consumers a Meter Maintenance Fee (MMF) each month, although PHCN neither provided nor serviced the meters.[[54]](#endnote-54) NERC declared the meter maintenance fee as illegal, and stopped the distribution companies from collecting it as from October 2011. Another major problem for electricity users is the method of using estimates for billing, with the result that many bills are over-estimated.

The proposed tariff increase that was supposed to take place at the beginning of 2012 was abandoned. This intended increase was extremely unpopular across the country, with people arguing that they couldn’t pay higher tariffs when faced with ongoing power outages. In April 2012, the Minister of Power announced that the government would carry out a new tariff review which would include the government subsidising the cost of power for the rural and urban poor. The tariff was increased at the beginning of June.

The government has been pushing forward with privatisation, despite President Goodluck Jonathan noting that many of the privatised enterprises in Nigeria are not doing well, and the setting up of a parliamentary ad hoc committee in 2011 to investigate the problems with privatisation.[[55]](#endnote-55)

For many commentators the privatisation of the electricity industry is seen as the answer to the inefficiencies and corruption in the electricity sector, despite overwhelming international evidence which shows that privatisation does not give the benefits expected (see the section on privatisation in this report). In addition, the process of privatising has introduced more corruption into the system, rather than solved the problem. For instance:

* There is frequently corruption associated with the selling of electricity companies or licencing IPPs – for instance the Egbin Power Station in Lagos which was set up by Enron. The deal for this IPP formed part of the prosecution against Enron executives for fraud. AES and YF power took over the IPP and there have also been calls for this deal to be investigated.
* Real conflicts of interest can emerge when players in the energy field are also involved in the government reform process. So for instance, Barth Nnaji, the Minister of Power, is the founder of Geometric Power Limited, a Nigerian company active in the IPP field. He is also integrally involved in seeing through the process of reforming the sector.[[56]](#endnote-56) Although he resigned from the Board of Geometric Power and put his shares in a blind trust, he was for many years a key adviser to the Minister while still active at Geometric.

NUEE (Nigerian Union of Electricity Employees) have strongly opposed the privatisation of the electricity sector. Among other actions, they went on a one week strike in November 2011 in protest against the ongoing plans to privatise.

Towards the end of 2011, Nigeria and the American government entered into an agreement which gives the IPPs operating in the country access to about $1.5 billion concessionary loans for the acquisition of equipment and services from the US.[[57]](#endnote-57) This loan effectively encourages the privatisation of generation as it is not available to government.

Currently about 50% of the country’s electricity is generated by IPPs. AES, Shell and Agip are three of the companies involved.

Currently, while Nigeria makes extensive use of hydroelectric power, it makes little use of other renewable energy sources. Most of the use of solar power is through small scale power supplies, generally in rural areas.

1. **Public provision still dominant**

The generation, transmission and distribution of electricity in Africa is still largely a government preserve, despite the heavy promotion of electricity privatisation by the World Bank and other donors since the 1990s.[[58]](#endnote-58) The state is also the main investor in the electricity sector, with nearly 90% of investments being carried out by the state.

The tables below reflect the extent of continued public sector dominance in distribution and transmission.

|  |  |  |  |
| --- | --- | --- | --- |
| **Distribution** | **Countries** | **Numbers** | **Percentage** |
| Public | Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Comoros, Congo, Congo DRC, Djibouti, Egypt, Eritrea, Ethiopia, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Libya, Madagascar, Malawi, Mauritania, Mauritius, Senegal, South Africa, Tanzania, Tunisia, Zambia, Morocco, Mozambique, Namibia, Rwanda, Sao Tome Principe, Seychelles, Sierra Leone, Sudan, South Sudan, Swaziland, Togo, Zimbabwe | 42 | 77.7% |
| Public Private Partnership (where private companies have been brought in as majority shareholders) | Cameroon  | 1 | 1.8% |
| PPP (with state as majority shareholder) | Cape Verde; Equatorial Guinea; Kenya; Mali; Chad; Niger; Somalia | 7 | 12.9% |
| Concession | Cote d’Ivoire; Gabon; Morocco; Uganda | 4 | 7.4% |
| Concession now terminated | Togo | 1 | 1.8% |
| Management contract | Gambia | 1 | 1.8% |
| Former management contract, now terminated | Chad, Kenya, Tanzania | 3 | 5.5% |
| Fully privatised | Nigeria | 1 | 1.8% |

Source of information: REEGLE; PSIRU database

Note: The percentage column does not add up to 100% as some countries are in more than one category.

|  |  |  |  |
| --- | --- | --- | --- |
| **Transmission** | **Countries** | **Numbers** | **Percentage** |
| Public | Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Central African Republic; Comoros; Congo; Congo DRC; Djibouti; Egypt; Eritrea; Ethiopia; Ghana; Guinea; Guinea Bissau; Lesotho; Liberia; Libya; Madagascar; Malawi; Mauritania; Mauritius; Morocco; Senegal; South Africa; Tanzania; Tunisia; Uganda; Zambia; Mozambique; Namibia; Rwanda; Sao Tome Principe; Seychelles; Sierra Leone; Sudan; South Sudan; Swaziland; Togo; Zimbabwe | 42 | 77.7% |
| Public Private Partnership (where private companies have been brought in as majority shareholders) | Cameroon | 1 | 1.8% |
| PPP (with state as majority shareholder) | Cape Verde; Chad; Equitorial Guinea; Kenya; Mali; Niger; Somalia | 7 | 12.9% |
| Concession | Cote d’Ivoire; Gabon | 2 | 3.7% |
| Concession now terminated | Togo | 1 | 1.8% |
| Management contract | Gambia; Nigeria | 2 | 3.7% |
| Former management contract, now terminated | Chad; Kenya; Tanzania | 3 | 5.5% |

Source of information: REEGLE; PSIRU database

Note: The percentage column does not add up to 100% as some countries are in more than one category.

Appendix one gives a more detailed breakdown of public/private provision in the different countries.

In both distribution and transmission, the public sector is dominant. For both transmission and distribution, in 77,7 % of countries surveyed, transmission and distribution is through the public sector. In distribution, of the 4 management contract entered into, 3 have not continued. For transmission, of the 5 management contracts entered into, 3 have not continued.

Many countries, despite World Bank pressure, and initial plans to privatise, have then reversed that decision and announced that the utility will not be privatised. In most cases, however, the country has, or intends to, introduce a management contract. The table below sets out the countries where full privatised has been averted:

|  |  |  |  |
| --- | --- | --- | --- |
| **Country** | **Name of public utility** | **Proposed privatisation plans** | **Management contract?** |
| Burkina Faso | SONABEL | Planned to privatise SONABEL scrapped in 2010.  | Intention is to introduce management contract.[[59]](#endnote-59) |
| Mauritania | SOMELEC | 2001 legislation ended monopoly of SOMELEC. 2002 government announced planned privatisation could not be completed. Plans to privatise SOMELEC abandoned. |  |
| Senegal | SENELEC | Two attempts to privatise SENELEC failed. |  |
| Tanzania | Tanesco |  | NetGroup Solutions (South Africa). Management contract proved unsuccessful. In 2008 contract not renewed. |
| Niger | NIGELEC | Plans to privatise scrapped in 2007 |  |

* 1. **Unbundling**

Even though the number of countries which have gone for the full privatisation of their electricity utility is small, the energy sector in some countries has, over the last decade or so, been restructured and reformed. In many cases the World Bank has played a key role in the restructuring process, as was the case, for example in Nigeria. It is therefore not surprising that the direction of the restructuring has been towards liberalizing the sector, with national utilities being unbundled, decentralized, corporatized and commercialized. The aim is to introduce reforms that will facilitate the involvement of the private sector.

While ten countries have unbundled their electricity utility, most have introduced legislation that allows for Independent Power Producers (IPPs).

At times the process of unbundling has resulted in a split between generation on the one hand, and transmission and distribution on the other, as happened in Kenya. At times it has resulted in a split between generation and transmission on one hand, and distribution on the other, as happened in Namibia. And at times all three have been separated, as is the case in Nigeria, with transmission, generation and distribution being split into separate successor companies.

After unbundling, the utilities have taken on different forms. For instance:

* In Namibia, distribution is now carried out by a number of REDs (Regional Electricity Distributors).
* In Nigeria the state utility was unbundled into a number of separate business units, which were then prepared for privatisation.
* In Kenya, both KPLC and Kengen were registered on the stock exchange. While Kengen is majority owned by the government, KPLC was initially not. This had consequences for KPLC which could not raise finances for its capital intensive projects without the implicit credit guarantee provided by government owned entities. KPLC is now majority owned by the government.

Not all state utilities have been unbundled. In Tanzania, for example, Tanesco remains a vertically integrated state utility. It is however, meant to be financially self-sustainable, and independent from government. However, it is struggling financially, not least because of the expensive arrangements it has entered into for emergency short-term power.

1. **Privatisation**

Hand-in-hand with the restructuring of state utilities as described above has gone the push to privatise the electricity sector across Africa – a push led by the World Bank.

Privatisation has taken many forms:

* The complete sale of state utilities
* Long term concessions
* Management contracts
* The entry of Independent Power Producers (IPPs) into the generation sector.

The most common form of privatisation is IPPs and management contracts, with very few complete sales of state utilities.

* 1. **Sale of state utilities**

In some countries, the vertically integrated monopoly has been sold.

For example, in Cameroon AES (a USA company) bought 56% of share capital of SONEL, the public utility. AES Sonel also has a 20 year concession for the generation, transmission and distribution of electricity.

In some countries, while the majority of shares in a state utility were sold to a private company, the government bought these shares back at a later stage. For example:

* In Cape Verde, the energy utility, ELECTRA, was incorporated in 1998. The government then sold 51% of its shares to a Portuguese consortium, Aquas de Portugal (AdP) in 1999. By 2005, however, ELECTRA was no longer able to provide reliable service, and was suffering financial losses. As a result the Cape Verde government regained control of the utility with the private consortium remaining a technical partner and minority shareholder. Currently the state owns 51%, private companies hold 34%, and municipalities own 15%.
* In Mali, the electricity utility was state-owned until 2000. As a result of reforms, 60% of the state utility was transferred to strategic partners – SAUR International and IPS West Africa. In 2005, SAUR sold its shares to the government of Mali. The government now holds the majority of shares, with IPS Africa holding 34%.

In some countries, the vertically integrated monopoly has been broken up. This happened for instance in Kenya with the breakup of the state utility into KPLC and Kengen. While Kengen remained majority owned by the government, KPLC was initially majority owned by private companies. This changed recently because of the implications this had for raising finances, and KPLC is now 51% owned by the government.

In some countries, the state utility has been broken up into a number of different components, and then these components have been sold off, as is currently happening in Nigeria. The successful bidders for the generating companies were announced in September 2012, and the successful bidders for the distribution companies are due to be announced in October 2012. The transmission company has been awarded as a management contract to Manito Hydro, a Canadian company.

* 1. **Management contracts and long term concessions**

Management contracts are contracts to manage and run the company, usually for 2 – 5 year periods, without the private sector making any significant investments. These contracts have been largely unsuccessful. 2009 figures indicate that out of 17 management contracts in 15 countries, 24% were cancelled, and by 2011, only 3 of those 17 were still in operation. Four were cancelled before the end of the contract, and 5 were allowed to expire at the end of the first term.[[60]](#endnote-60)

The table below sets out some of the management contracts – both ones that no longer exist, as well as ongoing ones.

|  |  |  |  |
| --- | --- | --- | --- |
| **Country** | **Project** | **Generation, Transmission, Distribution?** | **Status** |
| Kenya | KPLC – Manitoba Hydro | For distribution | Terminated - ran for 2 years. Ended 2008 |
| Nigeria | National Transmission company – Manitoba Hydro | For transmission | Current - Started 2012 |
| Chad | National Electricity Company (NIS) – Vivendi/Dietsmann | For vertically integrated utility (generation, transmission and distribution) | Terminated – Veolia pulled out four months into second phase of contract in 2004 |
| Tanzania | Tanesco – Net Solutions | For vertically integrated utility (generation, transmission and distribution) | Terminated – 2008 |
| Gambia | National Water and Electricity Company - Global Management Systems (GMS) | For vertically integrated utility (generation, transmission and distribution) | Current |

A report by the World Bank has shown that the effect of management contracts on a range of indicators has been insignificant. These indicators include cost recovery, system losses and collection rates. So even in the World Bank’s own terms, management contracts have not delivered the expected results.[[61]](#endnote-61)

The table below sets out some of the concessions, where they are, and their status.

|  |  |  |  |
| --- | --- | --- | --- |
| **Country** | **Concession** | **Generation, Transmission, Distribution?** | **Status** |
| Uganda | UMEME | Distribution | Current |
| Cameroon | AES Sonel | Distribution, transmission and generation | Current |
| Uganda | Nalubaale and Kiira (Eskom) | Generation | Current |
| Cote d’Ivoire | CIE (Finagestion) | Distribution, transmission and generation | Current |
| Morocco | Lydec-Casablanca | Distribution, transmission and generation | Current |
| Gabon | SEEG | Distribution, transmission and generation | Current |
| Morocco | Redal – Rabat/Sale (Veolia) | Distribution | Current |
| Morocco | Amendis-Tetouan and Tangiers (Veolia) | Distribution | Current |

Some countries have entered into long term concessions with private companies. 2009 figures indicate that 31% of concession contracts had been cancelled (5 out of 16 contracts).[[62]](#endnote-62)

In total, 27% of all management and concession contracts in sub-Saharan Africa have been cancelled. This is a very high rate of cancellation indicating a problem with these types of contracts.

Appendix two gives a list of companies involved in management contracts and concessions.

* 1. **Independent Power Producers**

IPPs (Independent Power Producers) generally involve the state-owned power utility retaining its position as the dominant generator, with the IPPs generating electricity which they sell to the state utility in terms of power purchase agreements (PPAs). They involve greenfield generation, and are privately financed.

There are approximately 20 IPPs producing more than 40MW operating in 8 countries in sub-Sahara Africa.[[63]](#endnote-63) Kenya, Tanzania, Uganda, Cote D’Ivoire, Ghana, Mauritius, Nigeria, Senegal and South Africa have two or more IPPs, while Togo, Angola, and Burkina Faso have one IPP.[[64]](#endnote-64) The following IPPs, which produce more than 40MW, use renewable forms of energy:

* OrPower4 in Kenya – geothermal
* Bujagali in Uganda - hydro[[65]](#endnote-65)

The remaining 18 IPPs which produce more than 40MW use various kinds of fossil fuels such as diesel, gas, heavy fuel oil, and natural gas.

There have been some major problems with some of the IPPs. The following table highlight some of these:

|  |  |  |  |
| --- | --- | --- | --- |
| **Country** | **Project name** | **Companies** | **Problems experienced** |
| Tanzania | IPTL | Mechmar (Malaysian)VIP | Construction costs very costly. Tanesco took co. to court and forced IPTL to reduce costs. Price of electricity very costly. Went to arbitration |
| Nigeria | AES Barge | AES | Initially owned by Enron – deal formed part of prosecution for fraud of Enron executives in USA.Costly. In arbitration |
| Tanzania | Songas | Globeleq, Tanesco, TPDC | Escalation of costs because of unplanned contracting of IPTL |
| Nigeria | Okpai |  | Escalating costs |
| Kenya | Westmont | Westmont Power (Malaysian) | Accused in 2003 of paying bribes; was ordered to cut its tariffs in half;7 year contract not renewed. |
| Kenya | Iberafrica | Union Fenosa; KPLC Staff Pension Fund | Engaged without any advertising for tendering and contract awarded in breach of tendering procedures.Audit report criticizes company for charging inflated prices.Iberafrica reaped huge financial benefits from the IPP  |

IPPs are associated with a range of problems:

* They are open to corruption
* They are very expensive for the country. Tanzania is an example of this, where Tanesco is spending about 90% of its revenue on IPPs.
* IPPs are also frequently not able to meet their contractual obligations consistently. This was found to be the case with IPPs in Senegal, Code d’Ivoire, Tanzania and Equatorial Guinea.[[66]](#endnote-66)
	1. **Provision of temporary power**

Because of the energy problems – too little, with too many disruptions - many countries rely on temporary power solutions, which are expensive. In a number of countries facing power shortages, the government has entered into short-term lease agreements with private companies which set up short-term plants using diesel generators. It is estimated that temporary emergency generators currently account for about 750 MW of capacity in Sub-Saharan Africa.[[67]](#endnote-67)

Private companies benefit hugely from this demand for temporary power. For example, Aggreko, a major international company hires out power generation equipment to many countries in Africa. It has recently, for example, entered into an agreement with Tanzania to produce 100MW of electricity. Because of the drought in Tanzania, which affected the country’s ability to generate sufficient electricity from its hydroelectric plants, Tanzania has been experiencing power shortages, which it is now attempting to deal with through expensive temporary power. It has contracted three companies to provide emergency temporary power. These are Symbion Power, Tanzania Limited, Aggreko, IPTL (Independent Power Tanzania Limited) and the National Social Security Fund (NSSF).[[68]](#endnote-68)

Interestingly, Aggreko’s short-term solutions are becoming increasingly long term, but without removing any of the problems associated with this type of arrangement. For example, Aggreko is delivering power from an “interim” gas-fired power plant in Mozambique. The Power Purchase Agreement (PPA) is with EDM (the Mozambican electricity utility) and Eskom (the South African electricity utility), and will supply both baseload and peak power to both utilities until July 2014.[[69]](#endnote-69)

In general, problems with temporary power include the following:

* They are expensive solutions.
* They are a high carbon option, particularly as they are mainly diesel-driven.
* They do not develop local capacity and thus undermine any long-term solution to the problem.
* They are also extremely noisy for local residents.
* In addition, procurement processes for temporary power have resulted in corruption and bribery problems, as can be seen in the example of Tanzania and Dowans.[[70]](#endnote-70)

In Uganda, Aggreko shut down its emergency power plants towards the end of 2011 at Mutundwe and Kiri because of the government’s failure to pay an outstanding bill. The government, however, said that these two plants were no longer viable and were too expensive to keep going. It said that between 2006 and 2011, it had spent at least Shs1.5 million on subsidies so that electricity users wouldn’t have to pay such high tariffs. The Ugandan government is planning to shut down all the emergency thermal plants.[[71]](#endnote-71)

* 1. **Company profiles**
		1. **Finagestion**

Finagestion is a French firm based in Paris. It was set up in 2003 as a wholly owned subsidiary of Bouygues. In 2005, when Bouygues sold SAUR, it retained the concessions it had in Africa. Finagestion then took these over. They are:

* CIE (Cote d’Ivoire)
* CIPREL (Cote d’Ivoire)
* SODECI (Cote d’Ivoire)
* SDE (Senegal)

Subsequently Bouygues started divesting itself of its interesting in Finagestion. In 2008 Emerging Capital Partners (ECP) bought a 29.3% interest in Finagestion, and in 2009 they bought a further 35.7%. By 2009 ECP had a 60% controlling share of Finagestion.[[72]](#endnote-72) Bouygues was now left with a 35% interest in Finagestion.

The Bouygues website indicates that Olivier Bouygues, the Deputy CEO of Bouygues, is a director of Finagestion, indicating that there are still strong links between Bouygues and Finagestion.[[73]](#endnote-73)

**Finagestion in Cote d’Ivoire**

CIE (Compagnie Ivoirienne d’Electricite) was set up after SAUR/EDF won a 15 year concession to operate the state owned electricity utility, EECI. CIE consisted of SAUR/EDF with 51% shareholding, and the Cote d’Ivoire government with 49% shareholding.

Bouygues, who owned SAUR, then sold SAUR, except for its operations in Africa, which included CIE. Finagestion, a Bouygues subsidiary, became the shareholder in CIE. According to the CIE website the current shareholding in CIE is Finagestion with 54%, FCP CIE with 5%, Cote d’ Ivoire government with 15%, and private investors with 26%.[[74]](#endnote-74)

Bouygues is also involved in an IPP in Cote d’Ivoire – CIPREL. Once Finagestion was formed, it took over Bouygues’ shares.

The second IPP in Cote d’Ivoire, Azito, has CDC/Globeleq as a shareholder with 11%. CDC now has investments in Finagestion.

This means that Finagestion has interests in both the electricity generation/transmission/distribution company; as well as in both IPPs active in the country. In other words, Finagestion, as a private company, dominates the energy sector in Cote d’Ivoire.

**ECP**

ECP is a US-based, international private equity firm that focuses on investing across the African continent through seven private equity funds. It has seven regional offices – in Abidjan (Ivory Coast); Tunis (Tunisia); Douala (Cameroon); Casablanca (Morocco); Lagos (Nigeria); Johannesburg (South Africa); and Nairobi (Kenya).

It has its origins in Emerging Markets Partnership (EMP). In 2005 ECP was spun out on its own.

The links between ECP and Bouygues are strong. The co-CEO of ECP, Vincent Le Guennou, who is also the vice-president of Finagestion, formerly worked for Bouygues in Cote d’Ivoire as the Chief Financial Officer of CIE. He then left CIE and joined EMP, and when ECP was spun out of EMP, he joined ECP.[[75]](#endnote-75)

ECP has done extremely well – reporting returns of up to 300 percent on their investments.[[76]](#endnote-76) ECP see their investment in Finagestion as a major opportunity to grow in West Africa. According to Hurley Doddy, chief operating officer of ECP – “the governments of West Africa are in favour of outside investment and private development of this sector in order to deliver power and water services to their vastly underserved populations”.[[77]](#endnote-77) ECP intends to “develop Finagestion as a true leader in the water and power sectors in West Africa by leveraging our financial expertise as well as our ability to mobilize resources”.[[78]](#endnote-78)

**Other investors in Finagestion**

CDC, the Development Finance Institution of the UK, also has “substantial” investments in Finagestion.[[79]](#endnote-79)

Since 2004 CDC’s strategy has been to invest equity in private enterprises in developing countries, rather than to provide aid directly. It invests this equity indirectly, through private fund managers.

In effect this strategy means that public money is being used to promote and facilitate private sector profit making. In addition, as The Corner House has noted, CDC’s strategy, of being a “fund of funds”, makes it difficult “to scrutinise its investments publicly, subject them to parliamentary oversight or to assess whether and to what extent they alleviate poverty”.[[80]](#endnote-80)

**Corruption allegations involving ECP**

ECP’s investments in Nigeria have been the subject of controversy and investigation. Several of the companies that ECP invested in have been accused of being a money laundering front for money it is alleged that James Ibori, the ex-Governor of Delta State in Nigeria, obtained through corrupt means. Ibori has recently pleaded guilty to conspiracy to defraud. He admitted in a UK court to stealing money from Delta state when he was the Governor and laundering it in London through a number of offshore companies.[[81]](#endnote-81)

ECP is now under investigation by the European Union’s Anti-Fraud Office (OLAF) and Nigeria’s Financial and Economic Crimes Commission. They are investigating whether ECP defrauded investors in ECP’s Africa Fund II of about $5 million.[[82]](#endnote-82)

ECP’s controversial investment has also reverberated on CDC, since ECP is one of the funds that CDC has put investments in.[[83]](#endnote-83)

**Finagestion in Nigeria**

Despite this controversy surrounding ECP, it is planning to continue its involvement in Nigeria through Finagestion.

A consortium, ProGlobal International Power Consortium, has been established in Nigeria to bid in the current privatisation of PHCN process. ProGlobal International Power Consortium was formed out of a partnership between ProGlobal Power Limited Nigeria, Finagestion and Symbion Power (USA).[[84]](#endnote-84) ProGlobal Power Limited Nigeria was set up in 2011, specifically with the intention of “taking advantage of the opportunity presented by the ongoing reforms of the power sector.”[[85]](#endnote-85) The intention is that while they bring “significant relationships within Nigeria”, their international partners bring technical expertise and experience.

ProGlobal International Power Consortium bid for the Enugu Distribution Company, as did three other companies.[[86]](#endnote-86)

Symbion Power also formed a consortium with Transcorp (a Nigerian conglomerate operating in the hospitality, agribusiness and energy sectors) and Woodrock to form Trancorp.[[87]](#endnote-87) Trancorp bid for Ughelli Power Plant as part of the PHCN privatisation process.[[88]](#endnote-88)

Symbion Power already operates in Tanzania where it bought out the Dowans plant after Tanesco, the state owned electricity utility, ended the power contract with Dowans over allegations of corruption.[[89]](#endnote-89)

Both Finagestion and Symbion Power are using links with local capital to get their foot into what they hope will be a lucrative energy market in Africa.

* + 1. **Umeme**

In Uganda, the Uganda Electricity Distribution Company Limited (UEDCL) was privatised in 2004 to Umeme, a company specially formed for this contract, in the form of a 20-year concession. At this point, CDC Globeleq (UK) had 56% shares in Umeme, and Eskom (South Africa), had 44%.

Umeme failed to make a profit, and by 2008, Eskom withdrew - selling its shares to Globeleq. In 2009, Globeleq then transferred its shares to Actis Infrastructure Fund, which like Globeleq is owned by the Commonwealth Development Corporation. Actis is now the owner of Umeme.

There have been on-going problems with Umeme. These include:

* Rapidly increasing prices for electricity with the result that the government has to pay a huge subsidy (60%) in order to ensure the tariffs are affordable. In 2004 the prices went up by 24% and in 2006 they went up again by 37%. A 2009 report indicated that Umeme had been overcharging by 44%.
* Apart from tariff increases, it has tried to increase its profits by arguing that it should pay lower lease payments for the use of the Ugandan network; and it has tried to get tax relief.
* It has attempted to pass off $29 million of non-core items as investments in the distribution system in order to be compensated for them.

Many in Uganda regard the Umeme contract as being unfair, extremely costly, and not only failing to deal with Uganda’s electricity problems but contributing to them. The government has acknowledged that it has paid Shs 2.413bn to Umeme as compensation for losses since 2005. In addition it has been paying 60% of the tariff in subsidies.[[90]](#endnote-90)

The Ugandan energy sector is facing so many problems that an adhoc parliamentary committee on Energy was set up towards the end of 2011. This committee was meant to

* investigate the extravagant thermal subsidies;
* assess the overall performance of the energy sector;
* investigate matters related to power losses, tariffs, subsidies and power generation;
* scrutinize agreements in the energy sector;
* and investigate whether the management of the Open Tender System (OTS) on purchase of oil products in Kenya has a bearing on production costs of thermal generation.

The committee was supposed to report back after 60 days, but 10 months later, the report had still not been tabled, although it had been completed. At one stage there were reports that, because of the delays, 3 of the 8 members of the committee were talking of writing their own minority report. This was subsequently denied.

According to Africa News, it is rumoured that the recommendations include the termination of the Umeme distribution contract, as well as the Eskom generation contract, a review of the power tariffs, a review of the cost of the power production, and a scrapping of the thermal power subsidies.[[91]](#endnote-91) Many in Uganda are calling for the renationalisation of Umeme. However, the contract signed in 2004 gives Umeme a massive compensation figure of $ 576 m (compared to the $80 million it has invested by August 2011), if the government terminates the contract early.[[92]](#endnote-92)

According to The Observer, in a 6 September 2012 report, the following points appear in the report:

* After seven years of the Umeme contract, the problems facing the energy sector remain the same – high power distribution losses, high billing and collection losses, poor quality services, low access levels, high initial connection costs, lengthy connection times, high operating and maintenance costs, rampant power outages and power thefts.
* Umeme has falsely claimed to have invested $130m (and since the government pays an annual 20% return on the investment made by Umeme, it is to their benefit to claim a higher investment than they actually did). According to the report, if this investment had been made, the network would have been substantially improved – with accurate billing and significant energy losses among other things.[[93]](#endnote-93)

Whereas UMEME recorded a loss of Shs2 billion in the year ended December 2010, in the year ended December 2011, it recorded a net profit of Shs23 billion. Cash generated from operations has gone up 38% from 2010, to Shs60bn.

This is a remarkable turnaround. It is difficult to analyse the long term trends and implications of the trends, however, because Umeme has only made public its financial records for two years – 2010 and 2011.[[94]](#endnote-94)

The company explains the turnaround from 2010 to 2011 as follows:

* The company has been able to curb power theft more effectively.
* They reduced energy losses from 30% in 2010, to 27.3% in 2011.
* The company had connected 13% new customers, which increased revenue collections. Despite this increase in connections, only about 1 million households are currently connected, whereas Umeme has a target of 6 million.
* Revenue collections were 99% compared to 95% in 2010.
* Switching on the Bujagali hydropower dam had stabilised distribution and consumption of power.[[95]](#endnote-95)

According to the Chief Financial Officer of Umeme, 2011 was “a year that demonstrated we have put in place the critical ingredients required for us to be a viable business”.[[96]](#endnote-96)

An additional measure recently announced by Umeme that will also increase its revenue is a new tariff structure. Tariffs will now be pegged to inflation and exchange rates as from October 2012.

Despite this profit being declared in 2011, Umeme has said that it does not have the money to roll out the pre-payment electricity meter project in the country, and it intends to list on the Uganda Securities Exchange in order to add more capital into the company so that it can afford the rollout. [[97]](#endnote-97)

Because of the huge problems that there are with the way Umeme bills users for electricity consumption (often just using an estimate), many have called for prepayment meters to be installed as a way of achieving more accurate billing. Unfortunately, experience elsewhere has shown that prepayment meters are extremely detrimental to the health and safety of electricity users, as well as being more expensive.

Obviously the financial results posted by Umeme for 2011 are good for it if it is planning to list on the stock exchange (it is planning to do this simultaneously in both Uganda and Kenya).

Some financial analysts have suggested that the listing on the stock exchange is less to do with raising capital, and more to do with Actis, which owns 100% of Umeme, finding a way of exiting Umeme. The suggestion is that 7 years into the 21 year contract, Actis has recouped its investment, in addition to profit made, and now needs to exit.[[98]](#endnote-98)

* + 1. **Manitoba Hydro**

Manitoba Hydro is a Canadian company which had a two-year management contract with KPLC in Kenya. It now has a Memorandum of Understanding with KPLC to cooperate in exploring and bidding for electricity business opportunities in Africa.

It recently won the management contract for the Transmission Company in Nigeria.

* + 1. **AES Sonel**

AES Sonel was formed when AES bought 56% of the energy utility in Cameroon – SONEL. This went together with a 20 year concession for AES Sonel to generate, transmit and distribute electricity.

In August 2012, the Cameroonian government put out a tender for consultants to review the outline lease, license and derivative contracts with AES Sonel. They have refused to say why they are doing this. However, the newspapers have speculated that it is to do with recent tariff increase that AES Sonel wanted, and that the government was unhappy with.[[99]](#endnote-99)

* + 1. **Tanjong**

Tanjong Energy Holdings was a former subsidiary of Tanjong PLC.

It started off with two IPPs in Egypt - Port Said and Suez Gulf. A third IPP, Sidi Krir, was owned by Globeleq and Edison International. By 2005 Globeleq owned 100% of Sidi Krir. In 2007, Tanjong, through its subsidiary, Pendekar Energy, bought the North Africa and Asia assets of Globeleq, including Sidi Krir. This means that by 2007 Tanjong owned all three IPPs in Egypt.

In 2012, Tanjong was sold to Malaysia Development Bhd, a Malaysian state-owned investment company.

* + 1. **Aggreko**

Aggreko (UK) is the world’s largest temporary power generation company. It operates in Tanzania, Uganda and Kenya. The 2011 annual report shows that its trading profit increased from £312 million in 2010 to £338 million in 2011, a growth of 26%. In their 2007 five year strategy review they aimed to deliver double-digit revenue and earnings growth over the period 2007-2012. In 2011 they are ahead of their plan – they have already delivered compound annual growth of 19% in revenue and 26% in operating profit over the first four years. Clearly providing temporary emergency solutions is a profitable business even in the time of a global economic crisis.

It is also interesting to note that Aggreko’s temporary solutions are becoming increasing long term.[[100]](#endnote-100)

* 1. **Favouring needs of business**

There are many examples of power plants being set up by, or for, companies, to use the power in their manufacturing process. The excess electricity produced is then sold to the main electricity distributor and added to the national grid; or sold to the local towns.

When electricity is produced from the heat generated during the processing of the raw material, it is known as co-generation. The company uses the electricity generated for its own needs and sell on any excess electricity.

Examples of co-generation include:

* The Bujagala Power Station in Uganda. It is owned by Bidco Oil Refineries. The oil processing factory crushes palm oil fruit into crude palm oil. This process generates heat, which is used to generate steam, which in turn generates electricity.
* The Mumias Sugar Company Ltd in Kenya, which produces electricity as an off-shoot of processing sugar.

Cases where power stations have been set up explicitly to meet the needs of business include:

* In Zimbabwe, Essar Holdings, which is a majority shareholder in New-Zimsteel is planning to lease ZESA’s Munyati power station to ensure that its Redcliff steel plant gets a reliable energy supply.
* In Kenya, the Kenya Tea Development Authority set up a hydro-electric power plant for three factories in Embu County to cut on energy costs and minimise consumption of firewood.
* In Namibia the Otjozondu Manganese project, which is 75% owned by an Australian company, needs a dedicated power supply of 130 MW. This is about 20 – 25% of Namibia’s current power consumption. According to the company, at the moment the smelter is not viable because of the high cost of power, and because it will not have access to enough electricity. Other smelting plants have dealt with this by making deals with the government to supply them with cheap electricity and to prioritise their needs. This is how, for instance, Billiton in South Africa runs a profitable smelter plant.
1. **Financing energy**
	1. **Main sources of investment**

Currently, governments are still the dominant source of finance for the energy sector.

A study conducted by the World Bank shows that only 11% of Africa’s investment needs for electricity infrastructure have been met by the private sector. And even then, this investment has mainly been in Independent Power Providers, rather than in extensions to the system.[[101]](#endnote-101) Not only do these IPPs not extend the system, but they generally have a heavy carbon footprint – generating energy through gas-fired plants, rather than through renewable sources such as hydropower.

Existing spending on power in Africa is $11.6 billion, much of which is spent on operating costs rather than investing in extending the system. Of this $11.6 billion, over 80%, or $9.4 billion is spent by the public sector ($7 billion on operation and maintenance and $2.4 billion on infrastructure development), with another 15% ($1.8 billion) coming from aid from donors and international development banks (also public sector). In contrast, private capital spends only $0.5 billion on infrastructure development, mainly through IPPs.[[102]](#endnote-102)

**Public sector leads investment in electricity in Africa – private sector very small**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Investment ($ billions) | Operational expenditure ($ billions) | Total investment and operational | Public sector as % of total |
| Country group | Public sector | Aid | Private sector | Total | Public sector |  |  |
| Total sub-Saharan Africa | 2.4 | 1.8 | 0.5 | 4.6 | 7.0 | 11.6 | 81% |
| *of which:* |  |  |  |  |  |  |  |
| * Resource-rich countries
 | 1.2 | 0.8 | 0.3 | 2.3 | 1.6 | 3.9 | 72% |
| * Middle income countries
 | 0.8 | 0.03 | 0.01 | 0.8 | 2.7 | 3.5 | 99% |
| * Low-income countries
 | 0.4 | 0.9 | 0.2 | 1.6 | 2.6 | 4.0 | 75% |

Source: World Bank/AFD 2010 Africa’s Infrastructure 2010 Table 8.3 p.186, and PSIRU calculations. Figures may not add exactly due to rounding. <http://www.infrastructureafrica.org/aicd/system/files/AIATT_Consolidated_smaller.pdf>

The African Development Bank has said that Africa needs to be spending $41 billion per year on power in order to meet Africa’s needs.[[103]](#endnote-103)

Private companies coming in as IPPs have, on the whole, been recipients of major incentives which benefit the private company at the expense of the government. Such incentives include customs and VAT exemptions during construction; full repatriation of profits; and tax holidays (for instance in Tanzania a tax holiday of five years was granted).[[104]](#endnote-104)

* 1. **Role of World Bank and other International and Regional Financial Institutions**

The World Bank plays a major role in the energy sector in Africa. It has loaned money and given grants to numerous projects. Some of this funding has come through the IFC, which is the private sector financial lending arm of the World Bank. It lends funds in order to encourage private sector involvement.

The explicit aim of the World Bank remains to encourage the liberalisation and privatisation of the energy sector. It does this both by providing assistance for restructuring processes which promotes liberalisation and privatisation; and by providing funding that does the same. For example, it has approved US$166 million in partial risk guarantees for four IPP projects in Kenya, in the context of Kenya struggling to attract further IPPs. And it played a key role in the development of the Electric Power Sector Reform Act of 2005 in Nigeria.

The African Development Bank has also played a key role in financing the energy sector. Towards the end of 2010, the African Development Bank approved $1 billion worth of financing for energy projects in Egypt, the DRC, Ethiopia, Kenya and Tanzania. The specific projects were:

* Egypt: $ 550 million loan to finance the construction of a 650-MW steam-cycle thermal power plant near Suez city, as well as improving the transmission lines from the plant. The power generated will mainly be used for industrial and commercial activities in the country.
* DRC: $ 106.6 million grant to finance rural and peri-urban electrification projects. More specifically it involves rehabilitating and extending the electric power distribution system in Kinshasa and selected localities in four provinces. It will also involve the installation of prepayment meters.
* Ethiopia: $143.44 million loan and $88.75 million grant to finance the electricity transmission system improvement projects.
* Kenya: $71.45 million loan for a power transmission system improvement project.
* Tanzania: $ 69.4 million to finance the Iringa-Shinyanga transmission line project.[[105]](#endnote-105)
	1. **Role of China**

China is an increasingly strong presence in Africa, with China-Africa trade growing by 33.5% a year between 2000 and 2008.[[106]](#endnote-106) A 2008 World Bank report highlighting China’s role in Africa notes that Chinese investment has tended to favour large-scale infrastructural projects. This is true in the energy sector, where China has become an increasingly large and key player, particularly in the area of large hydroelectric power projects. China is particularly active in Nigeria, Angola, Sudan and Ethiopia. Investments from China are channelled through the China Export-Import (Ex-Im) Bank. This Bank has an explicit mission to promote trade, and financial support is often tied to the participation of contractors from China.[[107]](#endnote-107)

It has two IPPs in Ghana, Bui Hydro (owned by Sinohydro), and Sunon Asogli Power Plant (owned by Shenzhen). This plant is not hydro, but rather uses a natural gas combustion engine.

Currently, Chinese engineering and manufacturing companies are involved in both large and small hydropower projects worth $9.3 billion in various countries across Africa.[[108]](#endnote-108) For instance, in Zambia, a Chinese company, Shandong Electric Power Construction Corporation (SEPCO), is involved in building a 300 MW thermal power plant, Maamba Collieries Limited. This is 65% owned by Nava Bharat of Singapore Pty Ltd (NBS) and 35% by Zambia Consolidated Copper Mine Investment Holdings (ZCCM-IH).[[109]](#endnote-109)

In Uganda two Chinese companies, China Water and Electric Corporation and Synohydro Corp, have been shortlisted to build the Karuma Hydro Power Dam project.

* China Water and Electric Corporation is the international arm of the China Three Gorges Project Corporation (CTGC), a government owned corporation.[[110]](#endnote-110) It has been involved in hydropower projects in Ghana, Ethiopia, and Sudan.
* Synohydro is a key Chinese company in construction.

In Ethiopia, Dongfang Electric Machinery Corporation is supplying electrical and mechanical equipment to the Gibe III hydropower plant. The Industrial and Commercial Bank of China will provide a $ 500 million loan for this. Sinohydro is responsible for constructing Gibe IV. Both these dams will have close to 200MW capacity each.

By the end of 2007, China was contributing $3.3 billion towards the construction of 10 major hydropower projects. The total size of these projects is 6 000MW.[[111]](#endnote-111)

Chinese companies are also playing an important role in other renewable energies such as solar power. Chinese investors are currently the top investors in African solar power, with the Chinese government making available $100 million for solar projects in 40 African countries.

Chinese companies are well supported by their government in investing in Africa, with China Development Bank Corporation, which is government owned, establishing in 2007a $1 billion fund to finance Chinese enterprises.[[112]](#endnote-112) Most infrastructure finance is channelled through the Ex-Im

Strong criticisms have been raised about Chinese companies’ failure to follow adequate environmental and social standards in implementing the large hydropower projects.[[113]](#endnote-113)

* 1. **Role of Japan**

Japan, through the Japanese International Cooperation Agency (JICA), has become increasingly active in the renewable energy sector in Africa. JICA coordinates official development assistance (ODA) for the Japanese government. For instance, JICA has given grants and loans for the development of geothermal energy in both Kenya and Ethiopia. It is also active in the energy field in Tanzania.

1. **Regional and International Bodies and Initiatives**
	1. **Africa-EU energy partnership (AEEP)**

African and EU heads of state adopted a Joint Strategy (JAES) in Lisbon in December 2007. There are 8 partnerships under this Joint Strategy – and energy is one of them. Under the energy partnership the two continents “share their knowhow and resources, tune their complementary interests and closely link their policies to meet the energy challenge hand in hand”.[[114]](#endnote-114)

The AEEP is being implemented by a Joint Expert Group (JEG), which meets biannually to discuss the implementation of priority actions. The JEG meetings feed into the Ministerial meetings which also take place biannually. Every three years there is an Africa-EU heads of state summit.

At the First High Level Meeting of the AEEP, held in September 2010, the Declaration of the First High Level Meeting of the AEEP was adopted. It sets targets for 2020 energy access, energy security and renewable energy and energy efficiency. It also includes a roadmap for the implementation of future AEEP actions. This roadmap includes the reinforcement of energy interconnections within Africa and between Africa and the EU. The Africa-EU Renewable Energy Cooperation Programme (RECP) was also launched at this meeting.

The RECP has identified four policy areas for cooperation:

* Action area 1: policy advisory services in order to strengthen institutions; develop supportive policy and regulatory frameworks for renewable energy investment in Africa. The aim is to attract foreign and local investment in the renewable energy sector.
* Action area 2: private sector cooperation, which promotes foreign investors accessing better information and developing stronger links between the private sectors on both continents.
* Action area 3: project preparation and flagship investment projects. This will help to counter high initial transaction and project development costs and facilitate appropriate project financing.
* Action area 4: technology, innovation, and capacity development. This area will help develop knowledge, skills and capacity.[[115]](#endnote-115)

The inaugural Stakeholder Forum of the AEEP was held in Cape Town in May 2012 and included government officials, ministers, business leaders, academics and people from civil society. Two strong themes emerge from the report of this meeting – firstly, there is an orientation towards the private sector, and their role in the energy sector, particularly the renewable energy sector, and secondly, following on from this, a focus on renewable energy and the opportunities it presents – both to business and to increasing access to electricity. The full report of the meeting can be found at <http://www.iisd.ca/ymb/energy/aeep/sf1/html/ymbvol181num2e.html>

The second stakeholders’ forum is scheduled for 2014.

* 1. **Programme for Infrastructure Development in Africa (PIDA)**

PIDA was developed by the AU Commission, the NEPA Secretariat and the African Development Bank in July 2010. It is meant to improve access to integrated regional and continental infrastructure networks. It also identifies priority renewable energy project for investment.

* 1. **Power pools**

Power Pools have also been created in the different regions of Africa. These pools link systems together, creating a larger electricity market. Different electricity producers are encouraged to compete to sell their electricity through the pool. Proponents of power pools argue that equal generation capacity doesn’t have to be developed in each country. There can, instead, be a situation of developing capacity in a few countries (for example, in a country with hydropower potential or solar power potential), which then exports electricity to other countries.

These power pools are seen as a way of making investment in the energy sector in Africa more attractive to the private sector. “The prospect of a larger regional market can attract more interest for private financing and public-private partnerships, which provides a possible solution to the region’s substantial financing gaps”.[[116]](#endnote-116)

1. **Pricing and Tariffs**

Tariffs are a source of contention in many countries. When a country restructures its energy sector by liberalising and privatising, having tariffs that are cost-reflective becomes vitally important. It is only by having cost-reflective tariffs, where the risk of price fluctuations is passed onto the electricity user, that private investors are attracted to the sector.

Many countries have, or are in the process of, increasing tariffs to be more cost-reflective. This is the case in Nigeria, where tariff increases are seen as part of the process of preparing the PHCN successor companies for privatisation. The country saw a tariff increase at the beginning of June 2012. The high price of electricity charged under the Umeme contract in Uganda has long been a source of considerable unhappiness to Ugandans.

In many cases tariffs are structured in such a way that the electricity users carry the risks associated with changing fuel prices and forex adjustments. This is the case in Kenya where the tariff fluctuates depending on the costs of fuel and forex. Between January and October 2011, for example, electricity prices increased by 55%.

Electricity users, particularly households, are the least able to afford the fluctuating tariffs that results from passing the risks of fuel costs and forex adjustments onto them. But by structuring the tariff in this way, the private sector investor is assured of their profit as they do not have to bear the costs.[[117]](#endnote-117)

With the non-payment of electricity accounts, not the least because accurate metering and billing is not done, pre-payment meters have been introduced in many countries. Again, this has been a key feature of the Nigerian experience as the electricity sector moves towards privatisation. Countries like Gambia and Zimbabwe and planning to roll out the use of pre-payment meters. ZESA, the Zimbabwean state electricity utility, has recently acquired 10 000 pre-paid meters.[[118]](#endnote-118)

For the World Bank and many governments, prepayment meters are an important part of ensuring that people pay for the electricity they consume – upfront. It takes away all billing and payment problems for the electricity provider. Many people also prefer prepayment meters because it allows them to plan and budget for their electricity usage, it removes inaccurate metering, inaccurate billing and so on. However, there are strong arguments against pre-payment meters. These include the problem that people end up self-disconnecting – in this way the political tensions around disconnecting non-payers is defused and non-payment (often because of an inability to pay) is turned from a collective problem to an individual problem. Because of self-disconnection, prepayment meters also carry health and safety risks, with the lack of money leading to no electricity even if it’s desperately needed in households caring for children, the sick, and the aged.

1. **Use of renewable energy**
	1. **Overview**

Internationally, by the end of 2011, renewable energy supplied about 20.3% of global energy – with 15.3% coming from hydropower, and 5% coming from other non-hydro renewable sources such as wind, solar, biomass, geothermal and biofuels.[[119]](#endnote-119) It is interesting to note that renewable energy’s share of total generation is increasing more slowly than the rapid increase of renewable capacity from year to year. This is because countries around the world continue to add significant amount of fossil fuel capacity.[[120]](#endnote-120)

Total global installed capacity of solar photovoltaics (PV) has grown the fastest of all the renewable energy technologies over the last four years, and in the last year, the price of PV has dropped quite considerably, as has the price of onshore wind power. This means that PV and wind are almost on par with fossil fuels in terms of costs. The fall in price came about for a number of reasons – including economies of scale, advances in technology, and, somewhat in contradiction to the growth of the industry, because of reductions in policy support for renewable energy. Some manufacturing companies have not survived the fall in prices and a number have recently collapsed – including Solyndra (US), Q-Cells (Germany), BP Solar, and First Solar.

Total global installed capacity of Concentrated Solar Power (CSP) has also grown rapidly – growing 37% in the end-2006 to 2011 period. Wind has grown 26%.[[121]](#endnote-121)

Africa is rich in renewable energy sources. These include solar, wind, hydro, biomass and geothermal. Hydroelectric power is the largest renewable energy generator in Africa, with wind, solar, wave, geothermal and biomass/waste generating relatively little electricity.

|  |  |  |
| --- | --- | --- |
| **2009** | Total electricity net generation | 597.745 Billion Kilowatts |
|  | Total renewable electricity generation | 101.936 Billion Kilowatts |
|  |  | Hydroelectric | 97.679 Billion Kilowatts |
|  |  | Wind | 1.623 |
|  |  | Geothermal | 1.286 |
|  |  | Biomass and waste | 1.313 |
|  |  | Solar tide and wave | 0.036 |

*Data taken from EIA website* http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=6&pid=38&aid=12&cid=r6,&syid=2006&eyid=2010&unit=BKWH

Growth in new renewable energy projects in Africa has been slow in 2011 – partly because of the Arab Spring which caused the postponement of some energy tenders. Despite this, the highest investments were in Morocco, with investments worth $1.1 billion, followed by Tanzania with $0.14 billion, Gabon with $0.2 billion and Nigeria with $0.1 billion. Kenya has also seen large investments in its renewable energy sector, with $2.5 billion worth of investment in 2010.[[122]](#endnote-122)

* 1. **Hydroelectric power**

Africa sits on considerable amounts of potential hydropower – particularly in countries such as Democratic Republic of Congo, Ethiopia, Cameroon, Angola, Madagascar, Gabon, Mozambique, and Nigeria. Already many of these countries draw heavily on hydropower as the source of their electricity. However, there are two problems with large hydropower projects:

* Firstly, building large dams has a major impact on the surrounding farmlands and communities. It generally leads to the displacement of people, and communities, and can change the flow of the river, thereby having a ripple effect on communities further downstream. Even large run of the river projects can have these negative effects.
* The generation of electricity by hydropower is dependent on there being enough water in the dams and rivers. In times of drought and water scarcity, this can become a major problem. Many countries in both East and West Africa have been suffering severe electricity shortages because they rely on hydroelectric power but are suffering from drought. Therefore for many countries, the aim is to move away from dependence on hydropower. This, for instance, is the case in Kenya, which is aiming to increase geothermal and fossil power substantially.

However, many countries continue to explore the use of hydropower. Countries such as Botswana, Burkina Faso, Ethiopia, Gabon, Ghana, Senegal, Democratic Republic of Congo, Rwanda, Sudan, Uganda and Zambia, are planning to harness the hydropower they have access to by building large dams.

Ethiopia is developing a number of hydroelectric plants. These include Tana Beles, a run-of-the-river hydroelectric power project, with a capacity of 460 MW, and the Gibe III and Gibe IV dams, expected to generate at least 200 MW each.[[123]](#endnote-123) These dams have caused controversy in one way or another. Egypt fears that the dam will impact on the Nile River downstream (the Beles River is a tributary of the Blue Nile). [[124]](#endnote-124) It is also feared that Gibe III, financed by the Chinese Development Bank, will threaten the existence of Lake Turkana, which straddles the Kenya-Ethiopia border, and is a World Heritage Site. The building of the dam is also expected to have negative environmental and social impacts.[[125]](#endnote-125)

Uganda is developing four large hydropower plants. The Bujagali plant is due to be fully commissioned by July 2012, and will generate 250MW. It has been developed by Sithe Global and the Aga Khan’s IPS Ltd. The Karuma Hydropower project (600 MW) is a public development, which has run up against financing problems as the potential funders – the German Development Bank, the World Bank and the European Investment Bank have questioned its size. They want it scaled back to a 400 – 450 MW plant.[[126]](#endnote-126) In 2008, the Ugandan government secured a loan from the Exim Bank of India to construct the Isimba Hydropower Project (140MW). In 2008 JICA assisted the government of Uganda to do an environmental impact assessment, and oversee the international bidding for a contractor, for the Ayago Hydropower Project. JICA is also the lead funding source for the project. It is being developed as a Public-Private Partnership.[[127]](#endnote-127)

The Regional Rusumo Falls Hydro-Power Project is a joint initiative of Rwanda, Tanzania and Burundi, which will have a capacity of 90MW. It is envisaged that it will strengthen the existing regional interconnected system between Burundi and Rwanda, and creation a new regional interconnection with Tanzania.[[128]](#endnote-128) It is expected to get funding from the World Bank and the African Development Bank.

Other regional hydropower initiatives include the 16MW Kikagati-Murongo hydropower project developed by Uganda and Tanzania. Rwanda, Burundi and DRC are working together on the 145 MW Ruzizi III hydroelectric project.[[129]](#endnote-129)

* 1. **Solar power**

There are two types of technology which can be used to harness the sun’s energy. These are concentrating solar power (CSP), and photovoltaic solar power (PV).

CSP technology uses the heat of the sun, concentrated by huge mirror-like structures into a receiver, which uses the energy to run a generator which produces electricity. Until recently CSP technology has been expensive, although there have been CSP plants for many years in Spain and the USA. In Africa, most CSP plants are currently in North Africa. A number of these countries brought on line CSP plants in 2011- including Egypt (20MW), Morocco (20MW), and Algeria (25 MW). South Africa is planning one of possibly the largest CSP solar power plants (100 MW) in Upington.

PV generates electricity directly from solar power through semiconductors in solar panels. Over the last few years there has been an increasing trend towards large utility-scale PV plants. Egypt is one of the countries in the world with a utility-size PV plant. The Solar PV sector has been growing rapidly, and the price has, at the same time, been falling, making it a strong contender against CSP for utility size solar energy plants.

Currently the largest solar PV system in sub-Sahara Africa is in Kenya. It has capacity for 0.5MW.[[130]](#endnote-130)

While PV has the advantage of being cheaper, CSP has the ability to be stored and is better able to hybridise with other energy sources. For instance, in North Africa, all the CSP plants are integrated solar combined cycle (ICSS) plants.

Two companies involved in CSP went bankrupt in 2011- Solar Millennium (a German company), and Stirling Energy Systems (USA).

* 1. **Geothermal**

Geothermal power relies on heat trapped under the earth’s surface. The East African Rift Valley, which spans 11 African countries, has great geothermal potential, but presently only a fraction of it is being tapped.

In Kenya there is a proven potential of 7 000 MW, but there is only installed capacity of 198MW. Kenya aims to meet 50% of its electricity needs with geothermal by 2018.[[131]](#endnote-131) It is estimated that if the geothermal energy in the Rift Valley could be more comprehensively tapped, it could provide 10 – 25% of East Africa’s energy.[[132]](#endnote-132)

Ethiopia has a pilot geothermal plant at Aluto Langano, which was established in 1998, but which only started producing electricity in 2007. The Japanese government undertook an investigation of the plant, and estimated that the plant could produce an additional 35 – 70MW electricity. Both the Japanese government, through the Japan International Cooperation Agency (JICA) and the World Bank, contributed funding to drill an additional 4 production wells at the site, under the control of the Ethiopian Electric Power Corporation (EEPCo), the government owned energy utility. The second phase of the project is planned to be completed at the end of 2013, and the third phase by the end of 2016. While the World Bank contribution was a loan, the Japanese Government contribution was a grant – which involved only Japanese companies being able to tender for the supply of materials and the work of drilling.

Rwanda is also exploring geothermal energy. It will drill its first exploration wells in Karisimbi in August 2012, in the hope that it will be able to establish a 10MW power generation plant at that site. The government is funding this first site, at an estimated cost of $5 m per well, in order to encourage private investors to develop further sites in the area. Geologists have predicted that there is about 740MW geothermal energy potential in the area. In particular, it is hoping that the private sector will develop four sites, at Gisenyi, Karisimbi and Kinigi and Bugarama, each with the capacity to generate 75MW.[[133]](#endnote-133) Companies from a number of countries have shown interest in Rwanda’s potential geothermal energy. Ackland Uniservices Ltd, New Zealand company has carried out a study of Rwanda’s geothermal potential. China Petroleum Technology and Development Corporation (CPTDC) is investing in the government drilling project with $7 million of drilling materials. The Belgian Development Agency has announced it is intending to spend $74 million by 2014 exploring Rwanda’s geothermal energy potential, with the aim of attracting investors.[[134]](#endnote-134)

* 1. **Wind power**

Worldwide, wind power has the most capacity put into operation in 2011.[[135]](#endnote-135)

However, so far relatively few wind power plants have been built in Africa, although there are at least 11 countries with commercial wind installations by the end of 2010. In North Africa, both Egypt and Morocco have wind farms.

Currently, Egypt has 550MW of installed wind capacity, which makes it the leader in Africa. It has the largest wind farm in Africa at Zafaranais, with 430 MW of installed capacity. It is operated by the New & Renewable Energy Authority (NREA) of the Ministry of Electricity and Energy.[[136]](#endnote-136) Egypt is currently planning to build a 250MW wind farm, which, it hopes, will generate 12% of its needs by 2020.[[137]](#endnote-137)

Morocco has a number of wind farms, the most recent being Dahr Saadane with capacity of 140MW.[[138]](#endnote-138)

* 1. **Biomass**

Both traditional and modern technology biomass are important sources of energy in Africa. Traditional biomass, such as charcoal, firewood and dung, is used extensively as an energy source for cooking and heating in rural areas. Often the biomass is burned in inefficient devices, and apart from being a waste of energy, can also affect people’s health and safety.

Biomass, known as bagasse, which is produced as part of the processing in sugar mills, is also used to generate electricity. Sugar mills which generate excess electricity in this way are able to feed it into the national grid. Grid-connected bagasse plants can be found in Kenya, Mauritius, Tanzania, Uganda, and Zimbabwe. In addition, Cameroon, Cote d’Ivoire, Ghana, Liberia, Nigeria, Rwanda, Senegal, Sierra Leone and Sudan are planning are planning such plants or are in the process of constructing them.

1. **Grand electricity generating schemes: the answer to Africa’s energy needs?**

There are two major electricity generating projects which are in the pipeline, both of which draw on renewable energy. Combined, they could generate enough energy to meet all of Africa’s energy needs. They are the Grand Inga Dam hydroelectric project and Desertec. However, their development by private sector interests limits their ability to contribute to meeting Africa’s development needs.

* 1. **Grand Inga**

The Democratic Republic of Congo is sitting on some of the largest hydro-generating potential, with the capacity to produce 100 000 MW of energy through hydro-power.[[139]](#endnote-139) Two dams, Inga I and Inga II have been generating electricity for many years already. Inga III and Grand Inga are still in the pipeline. Inga I and Inga II are currently undergoing major rehabilitation. The World Bank, European Investment Bank and African Development Bank are providing the finances for this.

The Grand Inga Dam Project could produce up to 39 000 MW of electricity. This project alone is expected to increase Africa’s electricity generation capacity by about 40%. Inga 3 would be able to generate 3 500 MW.

However, questions have been raised about the priority for distributing the electricity generated. It has been suggested that there is a lack of evidence to show that low-income electricity distribution is being made a priority part of the Grand Inga and Inga 3 plans. Instead of targeting millions on low-income households, it seems the investment focus is on feeding industrial and mining needs. In addition, it seems that there are plans afoot for some of the electricity generated to be exported to Europe.[[140]](#endnote-140)

Grand Inga was initially intended as an intergovernmental, multi-utility project, with Westcor, an entity made up of the utility companies of five African countries – Eskom, South Africa; Empresa Nacional de Electrididade in Angola; SNEL in the DRC; NamPower in Namibia; and Botswana Power Corporation in Botswana – developing Inga III and distributing the energy generated to the grids of Angola, Namibia, Botswana and South Africa. However, at the beginning of 2010 it was announced that the DRC government had decided to make it a national project, and Westcor would no longer be involved. Instead BHP Billiton, a major mining company, was to be given the go-ahead to develop the project. Much of the energy generated by Inga 3 will be used by BHP Billiton for its aluminium smelter in the Bas Congo province.[[141]](#endnote-141)

However, this has now changed again, as BHP Billiton pulled out of the project in February 2012. It is pulling out of building the aluminium smelter, because of high construction costs, and is therefore no longer interested in the dam either.

Grand Inga will now be built jointly by South Africa and the DRC, with Eskom and SNEL developing timeframes and an implementation framework.[[142]](#endnote-142)

Grand Inga was named as one of the infrastructure projects in the G-20’s Plan on Infrastructure.

* 1. **Desertec**

Desertec is an ambitious plan to harness mainly solar, but also wind energy, in the North African deserts to generate electricity. Desertec Industrial Initiative (Dii), a German-registered company with 21 shareholders, is spearheading the initiative, which will involve establishing a network of Concentrating Solar Power (CSP) plants in the deserts of Algeria, Morocco and Tunisia. While some of the energy generated will meet local needs, it is envisaged that much of the energy will be transmitted to Europe. This will both meet some of Europe’s energy needs (an envisaged 15% by 2050), but will also help Europe meet its target for renewable energy. The energy will be transmitted across the Mediterranean Sea using high voltage direct current cables.

In setting up CSP plants in the Sahara Desert, Dii is looking to build partnerships with Tunisia, Libya, Algeria and Morocco to take forward the project. While the Dii head office is in Munich, Germany, it has also recently established offices in Rabat, Morocco and Tunis, Tunisia.

Dii plans to bring one CSP plant, with some of its energy being exported to Europe, into operation by 2013. This will be followed by two further projects. These initial projects are designed as pilots to gather information before more extensive plans are rolled out. Dii’s first project is located in Morocco. It is also exploring the establishment of two reference or co-operation projects in Tunisia.

Creating a viable internal European energy market and connecting it to the MENA countries will require the development of a high voltage direct current grid. Much of the existing internal European infrastructure will need to be upgraded to cope with the shift from large-scale, centralised, one-way transmission, to decentralised, flexible, interactive, bio-directional and intermittent renewable energy sources.[[143]](#endnote-143) Intelligent grid and storage facilities, which European countries are obliged by the EU’s directive on Renewable Energy 2008 to develop, will also be required to cope with the use of renewable energy.[[144]](#endnote-144)

Desertec is not the only initiative in North Africa focusing on drawing on solar power. The Clean Technology Fund (CTF), a funding mechanism implemented by the multilateral development banks (MDBs), which focuses on low carbon development and the use of clean technologies, has a specific programme focusing on the development of CS P in the Middle East and North Africa Region.[[145]](#endnote-145) This programme will assist with the financing of the expansion of CSP in Algeria, Egypt, Jordan, Morocco and Tunisia.

In providing this funding, however, the CTF investment plan makes it clear that certain market principles must be adhered to, and it envisages the private sector playing a key role in the development of CSP in the region. For instance, the plan makes clear that:

* One of the attractions of the CTF funding CSP plants in the region would be that it would assist in attracting private sector interest;
* It will be necessary to remove energy subsidies, which are regarded as “systemic barriers”, as well as introduce “favourable policies that will encourage commercial utility operations”. Subsidies, rather than being seen as necessary to ensure that everyone, including the poor, has access to affordable electricity, is regarded as hampering the development of the CSP market, presumably because it discourages private sector investment.[[146]](#endnote-146)
	1. **Meeting Africa’s needs?**

The Desertec project will generate vast quantities of electricity from Africa’s sunshine, while the Grand Inga project will generate large quantities from Africa’s rivers power. However, much of this electricity will go towards either meeting Europe’s energy needs or the energy needs of industry and mining. It is less clear how much of this energy generated will go towards increasing access of all in Africa to electricity.

In its literature the Desertec Foundation and DII talk about the project aiming to supply up to 15% of Europe’s electricity need, and “a substantial part of the energy needs of the MENA countries”.[[147]](#endnote-147) In other words, the instigators of the project seem a lot clearer about how much electricity the project will generate to meet Europe’s needs, and much less clear about how much of Africa’s electricity needs will be met.

One of the motivations for meeting some of Africa’s energy needs seems to be that this will be necessary in order to ensure security of supply to Europe. As a Price Waterhouse Cooper report notes: “achieving security, given flows of power from North Africa into Europe, will in turn require the integration of Europe and North Africa into a single, well-functioning market, where all countries involved have an incentive to see the smooth flow of electricity and revenues as being in their own continued self-interest. It also implies that North Africans will need to have fair and affordable access to electricity, in turn requiring a sharp rise in capacity to serve the North African segment of the market, so that the mutual security of supply for both North Africa and Europe is maximised”.[[148]](#endnote-148)

This approach is echoed in the opening speech given by the EU Commissioner for Energy to the recently held DII annual conference in Barcelona. He stated that Desertec will only succeed if “it benefits our Southern Partners in order to meet their own security of supply – this means that part of the electricity needs to be dedicated to the local markets at an affordable price”.[[149]](#endnote-149)

It seems that part of the reason that Desertec is vague about how much of Africa’s electricity needs will be met is their argument that each country in the MENA region will be able to decide for themselves how much electricity generated through the Desertec project to keep for themselves, and how much to sell profitably to Europe.

“It is left to the sovereignty of the producing countries as to whether they use the clean energy to meet their own demands first and finance this energy supply through the profits that they earn from selling or dispensing with the fuels that are thus saved, or sell the energy profitably to Europe and wait until the relevant technology becomes cheaper. In the light of the enormous potential that solar energy entails, these countries could take advantage of both possibilities at the same time”.[[150]](#endnote-150)

However, since the founders of this project are so clear on how much this project will benefit Europe in the long run, there will presumably be some obligation on the MENA countries to send a certain amount of the electricity generated to Europe. And in fact, this is the case. According to the Desertec “Red Book” on its website, one of the steps that needs to be followed between now and 2012 as part of putting the project in place is to establish “long-term binding purchasing agreements on the part of EU countries which stipulate appropriate conditions and minimum quantities with regard to the import of clean power from the MENA region”.[[151]](#endnote-151)

It is estimated that by 2050, because of population and economic growth, the demand for energy in the MENA countries will be as high as the demand in Europe, namely 3 500 TWh a year.[[152]](#endnote-152) The argument therefore is that the MENA countries need to look at putting renewable sources of energy into place now to help meet this need. Desertec, as well as Greenpeace International take the approach that the MENA countries have the resources (i.e. the sun and the wind), while Europe has the technologies and support mechanisms to be able to exploit the sun and wind to the benefit of all.[[153]](#endnote-153)

However, research has shown that when developing countries become too reliant on the export of natural resources, their economies can become very vulnerable to market volatility in the resource market. In addition, with natural resources there is generally competition between competing interest groups to gain legal access to the resource. This can pave the way for corruption as commercial interests attempt to bribe state officials as part of getting ahead in the competition.[[154]](#endnote-154)

1. **The future for energy in Africa**

A major problem facing countries in Africa is lack of access to electricity, particularly in rural areas. There is a lack of generation capacity, electricity grids often don’t extend far into rural areas, and electricity infrastructure is, in many cases, in need of maintenance and upgrading.

For many years, the World Bank and similar international bodies have promoted the liberalisation and privatisation of electricity as the way to increase coverage. However, despite the vast resources the World Bank has poured into this policy approach, it is now broadly accepted that privatisation, in whatever form, has not been successful in Africa.

Some of the problems identified with privatisation, which the previous sections have begun to unpack include:

* Privatisation hasn’t attracted the finances that are expected. Between 1999 and 2003, less than 4% of global private investment in infrastructure went to sub-Saharan Africa.[[155]](#endnote-155) And only 11% of Africa’s investment needs for electricity have been met by the private sector.
* The emphasis on cost recovery undermines attempts to meet the social objectives of reducing poverty and inequalities.[[156]](#endnote-156)
* Many international energy companies have identified Africa as a potentially lucrative market and have, under often questionable circumstances, partnered with local companies or individuals to gain access to the local market.
* In many cases, local companies have been set up to take advantage of the opportunities for profit making opened up by the liberalisation and privatisation of the electricity sector. They have put in bids for contracts without any specific energy expertise or technical knowledge. This has happened, for instance, in Nigeria.
* Not surprisingly, corruption is a common problem where this is privatisation as different parties compete to gain access to what they hope will be lucrative contracts. An example of this can be seen in the case of Richmond/Dowans which was supposed to supply short-term emergency power in Tanzania.
* Neither of the two main forms of private sector involvement in energy – management contracts and IPPs – have proved very successful or durable. For instance, countries, such as Kenya, have struggled to attract IPPs – the private sector goes where it can make the most profit. But this is generally not where there is the greatest need.
* Privatisation or plans to privatise have inevitably led to higher prices. Increased tariffs are an integral part of preparing an electricity utility for privatisation, as is happening in Nigeria now. There is also the problem of pushing the risk of forex adjustments and fuel cost variability onto electricity users.

Over the last decade or so, many countries, such as Burkina Faso, Mauritania, Senegal, Tanzania and Niber, have opted not to go the route of privatisation. This is despite being under pressure from the World Bank to do so. However, some countries have followed World Bank policy advice in that they have unbundled their electricity utility in one way or another. Unbundling has not, however, resulted in more coverage or more effective service delivery.

In a context of increasing interest by private companies in Africa’s energy sector, the desperate need for electricity, and the urgent need to cut carbon emissions because of climate change, it is time to reassert the importance of and need for public provision of electricity.

Public provision of electricity must be done by taking into account the following principles.

* There must be public debate, public goals and political processes in determining the future direction of the energy sector.
* Electricity must be treated as a vital developmental sector and a vital public service.
* An efficient and effective public sector operator must be the key to development.
* Public finance must be used to support investment.
* Subsidies and cross-subsidies must be used for extensions and affordability.
* The public electricity operator must be transparent and accountable.
* And, taking climate change into account, there must be increasing use of renewable energy sources.

These are dealt with in turn below.

* 1. **Democracy and public sector control**

It is important that the development of the energy sector in any country is open, participative and inclusive. This is the only way to make it possible for decisions about the energy sector to be taken in the interests of the broad mass of people in the country, rather than in the interests of private companies, and international institutions. As set out above, experience shows that privatisation operates against such open democratic processes, delivering corrupt, secret contracts which leave the public helpless to prevent the extraction of extortionate profits.

* 1. **Electricity as a public service**

For a number of reasons, electricity is best delivered by the public sector.

* It is economically and socially necessary in a modern society. Business and public service can’t function without it; and it significantly improves the quality of life of households and communities. There is a social and economic need for universal affordable access, regardless of the user’s immediate ability to pay to full cost of connection or supply, or of corporate requirements for profitability.
* Electricity has to be continually provided as it is difficult to store it for long periods of time. The system also has to be balanced between supply and demand, for technical reasons, requiring the on-going effective management of the system.
* Electricity is a sector that does not lend itself to competition. It is a standard product; there is no substitute for electricity in powering devices and machinery; and electricity transmission and distribution networks are natural monopolies, making competing networks unviable.
* The generation and transmission of electricity has enormous environmental impacts. Generating electricity consumes natural resources like oil and coal, and emits polluting gasses into the atmosphere. Major environmental damage is caused by the construction of dams or generating facilities, as well as transmission and distribution lines. The impact on people’s livelihoods can also be enormous. Only an effective public policy could minimise this environmental impact.

For all these reasons, electricity is best retained in the public sector where it can be treated as a coherent public service managed by a public authority.

* 1. **Effectiveness of public sector**

The electricity system of nearly all high income countries in the north were developed through the public sector, using municipal or state-owned vertically integrates systems, with subsidies used to finance expansion f the systems to all households.

The experience in Africa has been similar. A 2005 World Bank report on electrification in a sample of African countries found that electricity extensions were largely a result of government intervention, using public investment and subsidy. On the other hand, full cost recovery associated with privatisation makes electricity less affordable for the poor.[[157]](#endnote-157)

* 1. **Public finance for investment**

In general, the cost of capital to the public sector is cheaper than it is to the private sector, even in Africa. With private companies having invested little in the electricity sector in Africa, the public sector remains the largest, and cheapest, source of finance for the sector.

* 1. **Decent employment**

Workers are key to the delivery of energy. Unless workers are paid a decent wage, given adequate social benefits, and good working conditions, the effective and efficient delivery of electricity is undermined.

* 1. **Subsidy, cross-subsidy and taxation**

In order to make electricity affordable, there must subsidies and cross-subsidies for the poor. The private sector is not interested in subsides and cross-subsidies as they harm their profit margin. Only the public sector can effectively ensure affordable electricity for all.

* 1. **Transparency and governance**

The public sector does need reform. But this can only be done by a transparent, accountable and inclusive process.

* 1. **Renewables**

Renewables have the potential to generate electricity through large utility size operations, as well as through small-scale, decentralised local operations.

The possibilities for small scale energy generation with renewables opens up the possibility of making electricity accessible in rural areas far quicker than if they had to wait to be connected to the grid. It also opens up the possibility for much greater community control over electricity and its generation and distribution. However, it also opens up the way for easier privatisation; and for the state to absolve itself of responsibility for electricity and pass it onto communities.

Too often, renewables are seen as the preserve of the private sector because they are greenfield areas. However, this is a dangerous position to take. As this report has highlighted, there are enormous and ongoing problems with private sector involvement in the energy sector. At the heart of these problems is that the private sector is driven by the need to constantly grow its profit. Thus meeting social and environmental needs and objectives is not a priority.

There is no reason to believe that that the private sector will have any more success in the area of renewable energy in meeting people’s needs that it does with its involvement in conventional energy.

What is also clear is that, despite the potential for the use of renewables in Africa, and the commitment of many governments and bodies such as the AEEP to renewable energy, too often governments fall back on non-renewable energy sources to bolster their capacity. Many countries, such as Kenya and South Africa, while implementing a renewable energy programme, continue to build new thermal generating capacity, which will make use of coal, oil or gas. And yet, the technology is now sufficiently advanced, and the costs have dropped sharply (particularly of solar PV and wind) – making it possible for all future new generating capacity to only be from renewable sources.

The challenge then is to promote the move to renewable energy – both because it is a necessity in the context of climate change; and because it opens up the way to quick access to electricity for those who don’t have it. However, this promotion must be done in the context of renewables being delivered by the public sector, and not through the IPP model, as is currently happening in many countries.

1. **Appendix one: Overview of public provision of electricity**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Country** | **Vertically integrated?** | **Public or private?** | **Name of public entities** | **Name of private companies** | **Sector structured to allow private sector involvement?** |
| Algeria | No – public company unbundled into holding company with 8 other companies that deal with transmission, generation and distribution | Generation, transmission, distribution = Public | Societe Nationale de l'Electricite et du Gaz (SONELGAZ) = holding company |  | 2002 law required SONELGAZ to unbundle into holding company.  |
|  | 3 IPPs |  | 3 IPPs:Algerian Energy Company (AEC) (Arzew); SNC-Lavalin (Hadjiret and Skikda) |  |
| Angola | 2 power utilities – ENE is vertically integrated | Generation, transmission, distribution = Public | Empresa Nacional de Electricidade (ENE) - produces power and distributes about 30% in south and central region; Empresa de Distribuicao del Electrididade (EDEL) - buys power from ENE and distributes in north. |  | Debate about opening up to IPPs |
| Benin | Electricity generated by public company owned by Benin and Togo (CEB); distribution by SBEE | Generation, transmission, distribution = Public | Communaute Electrique du Benin (CEB) - binational company owned by Benin and Togo. Societe Beninese d'Energie Electrique (SBEE) distributes electricity. |  | 2006 law ended CEB monopoly over production. Particular focus on facilitating private sector involvement in rural areas. |
| Botswana | Vertically integrated | Generation, transmission, distribution = Public | Botswana Power Corporation (BPC) |  | 2007 Energy Supply Act allows for IPPs |
| Burkina Faso | Vertically integrated | Generation, transmission, distribution = Public | Societe Nationale D'Electricite du Burkina (SONABEL) |  | Intention was to privatise SONABEL. This was scrapped in 2010. But intention is to implement management contract. |
| Burundi | Vertically integrated | Generation, transmission, distribution = Public  | REGIDESO (Regie de Production et Distrib ution d'Eau) |  | Privatisation started in 1989, but political conflict ended process. |
| Cameroon | Vertically integrated | Private - state utility privatised in 2001 when 56% of shares in SONEL sold to AES. AES SONEL has20 year concession on distribution, generation and transmission |  | AES Sonel | Yes |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Country** | **Vertically integrated?** | **Public or private?** | **Name of public entities** | **Name of private companies** | **Sector structured to allow private sector involvement?** |
| Cape Verde | Vertically integrated | Public-private partnershipELECTRA = state (51%); private companies (34%); municipalities = 15% | ELECTRA |  | Yes |
| Central African Republic | Vertically integrated | Public  | ENERCA (Energie Centrafricaine)  |  |  |
| Chad | Vertically integrated | Public with management contractNIS owned 81.2% by government and 18.8% by French Development Agency (AFD) | National Electricity Company (NIS) | Former management contract between 1999 and 2004 held by Vivendi-Dietsmann | Yes |
| Comoros | Vertically integrated | Public | Gestion de l’Eau et de l’Electricite aux Comores (MAMWE) |  | Government document – “Povety Reduction and Growth Strategy Paper” (PRGSP) indicates MAMWE will be privatised |
| Congo | Vertically integrated | Public | Societe National d’Electricite (SNE) |  |  |
| Congo DRC | Vertically integrated | Public | SNEL (Societe National d'Electricite) |  |  |
| Cote d’Ivoire | Vertically integrated | Concession |  | Concession: Compagnie Ivoirienne d'Electricite (CIE) (majority owned by Finagestion ) | Yes |
|  | 2 IPPs |  | IPPs: Finagestion (CIPREL); Cinergy (Azito) |  |
| Djibouti | Vertically integrated | Public for some of country; rest is covered by private | Electricite de Djibouti (EDB) |  | Yes |
|  | PPP set up for renewable energy – May 2012 |  | Djibouti Power Light (DJPL) – owned by Turn-Key Energy |  |
| Egypt | State owned organisation split into 16 affiiliated ompanies - 6 production; 9 distribution; Egyptian Electricity Transmission Company | Public | Egyptian Electricity Holding Company (EEHC) |  | Despite unbundling, companies weren’t privatised. Some IPPs and generating plants built on BOOT model. |
|  |  |  | IPPs = Tanjong Energy Holdings (Malaysia) |  |
| Equatorial Guinea | Vertically integrated | Public (majority state owned) | Sociedad de Electricidad de Guinea Ecuatorial (SEGESA)Government = 62%; Infinsa (Spanish) = 38% |  | Yes |
| **Country** | **Vertically integrated?** | **Public or private?** | **Name of public entities** | **Name of private companies** | **Sector structured to allow private sector involvement?** |
| Eritrea | Vertically integrated | Public | Eritrea Electric Corporation (EEC) |  | 2004 Proclamation 142 commercialised utility; Proclamation 141 (2004) promotes private sector involvement |
| Ethiopia | Vertically integrated | Public | Ethiopia Electric Power Corporation (EEPCo)  |  |  |
| Gabon | Vertically integrated | Concession | Societe d'Electricite et d'Eaux du Gabon (SEEG) – state owned but run by concessionaire | Concession company: Veolia (French) on 20 year contract | Yes |
| Gambia | Vertically integrated | Public – with management contract | National Water and Electricity Company (NAWEC)State = 92.7%; Social Security and Housing Finance Capital (SSHFC) owns remaining | Management contract with Global Management Systems (GMS) (German) | 2006 Electricity Law - opened up generation component of sector to private investors; also allows for private involvement in distribution. |
| Ghana | Generation, transmission and distribution split | Generation = Public  | Volta River Authority (VRA) and Bui Power Authority (BPA)  |  | Industry was unbundled to allow for private sector investment |
|  | Generation = IPPs |  | TAQA (Takoradi International Power plant); Shenzhen (Sunon Asogli Power Plant); Sinohydro (Bui Hydro) |  |
|  | Transmission = Public | Ghana Grid Company (GRIDCO) |  |  |
|  | Distribution = Public | Electricity Company of Ghana (ECG) and Northern Electricity Department (NED) - a subsidiary of VRA |  |  |
| Guinea | Vertically integrated | Public | Guinea State Electricity Company (EDG) (Societe d'Etat d'Electricite de Guinee) |  | 2003 = EDG created as limited company |
| Guinea-Bissau | Vertically integrated | Public | Electricity and Water Company of Guinea-Bissau (Electricidade e Aguas de Guinea-Bissau, EAGB) |  |  |

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| --- | --- | --- | --- | --- | --- |
|  **Country** | **Vertically integrated?** | **Public or private?** | **Name of public entities** | **Name of private companies** | **Sector structured to allow private sector involvement?** |
| Kenya | Generation, transmission and distribution split | Generation = public | Kenya Electricity Generating Company (KenGen)State owned with 30% listed on Nairobi stock exchange |  |  |
|  |  | IPPs |  | IPPs: Iberafrica Power (EA) Co Ltd; Tsavo Power Co; Orpower 4 Inc; Rabai Power Company Ltd; Imenti Tea Factory Co; Mumias Sugar Co Ltd |  |
|  |  | Transmission and distribution = public | Kenya Power and Lighting Company (KPLC)Majority state owned; listed on stock exchange | Former management contract with Manitoba (2006 – 2008) |  |
| Lesotho | Vertically integrated | Public | Lesotho Electricity Company (LEC); also Lesotho Highlands Development Authority (LHDA) - generates electricity through the Muela hydropower station |  | 2002: LEC turned into company.2006 Energy Policy: set goal of privatisation. |
| Liberia | Vertically integrated | Public |  |  |  |
| Libya | Vertically integrated | Public | General Electricity Company of Libya (GECOL) |  |  |
| Madagascar | Vertically integrated | Public | Jiro sy Rano Malagasy (JIRAMA) |  | 1999 reforms encourage PPPs JIRAMA run as commercial company |
| Malawi | Vertically integrated | Public | Electricity Supply Corporation of Malawi (ESCOM) |  |  |
| Mali | Vertically integrated | Public | Energie du Mali (EDM-SA)Majority state owned; run as a company |  | 2000 reforms brought in strategic partners to the state utility |
| Mauritania | Vertically integrated | Public | Societe Mauritanienne de l'electricite (SOMELEC) |  | 2001 – legislation ended monopoly of SOMELEC.  |
| Mauritius | Vertically integrated | Public | Central Electricity Board (CEB) |  |  |
|  | IPPs |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| **Country** | **Vertically integrated?** | **Public or private?** | **Name of public entities** | **Name of private companies** | **Sector structured to allow private sector involvement?** |
| Morocco | ONE owns the transmission network and majority of distribution grid. | Public | Office National de l'Electricite (ONE) |  | Opened to IPPs in 1994; by 2002 ONE began restructuring to allow subsidiaries to be formed |
|  | IPPs |  | Jorf Lasfar (Taqa); Tahaddart; Tetouan Wind Power Project (Theolia) |  |
|  | Distribution concessions |  | Lydec - Casablanca; Redal - Rabat/Sale |  |
| Mozambique | Vertically integrated (though weak generating capacity) | Public | Electricidade de Mocambique (EDM) |  | Electricity Law introduced in 1997 allowing for private sector participation in electricity industry under concession system |
| Generation | Public – jointly owned by Portual (82%) and Mozambique(18%) | Hidroelectrica de Cahora Bassa (HCB) |  |  |
| Namibia | Generation and transmission vertically integrated | Public | NamPower |  |  |
| Distribution | Public | Regional Electricity Distributors (REDs) |  |  |
| Niger | Vertically integrated | Public (gov. owns 95%; rest owned by private companies) | Societe Nigerienne d’electricite (NIGELEC) |  | Electricity Code of 2004 – allows for establishment of IPPs  |
| Nigeria | PHCN (Power Holding Company of Nigeria) In process of being unbundled into 18 companies: 7 Generation; 1 Transmission; 11 Distribution | Generation = private |  | Successful bidders (announced Sept. 2012): Amperion Power Distribution Limited; CMEC/Eurafric Energy Ltd; Transcorp; North-South Power; Mainstream Energy Solutions Limited | Electric Power Sector Reform Act 2005 |
|  | IPPs |  | IPPs: AES (AES Barge); NNPC (Okpai); NNPC (Afam IV); Geometric Power Limited (Aba Integrated Power Project) |  |
|  | Distribution = private |  | Successful bidders to be announced October 2012 |  |
|  | Transmission = public with management contract |  | Manitoba Hydro (Canadian) |  |
| Rwanda | Vertically integrated (including water and sanitation) | Public | Energy, Water and Sanitation Authority (EWSA) |  |  |
| Sao Tome Principe | Vertically integrated | Public | EMAE |  |  |

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| --- | --- | --- | --- | --- | --- |
| **Country** | **Vertically integrated?** | **Public or private?** | **Name of public entities** | **Name of private companies** | **Sector structured to allow private sector involvement?** |
| Senegal | Vertically integrated | Public | Societe Nationale d'Electricite du Senegal (SENELEC) |  | IPPs allowed since 1998 |
|  | IPPs |  | Mitsubishi (Kounoune I); GE Capital Structured Finance Group (GTi Dakar) |  |
| Seychelles | Vertically integrated (including water and sanitation) | Public | Public Utilities Corporation (PUC) |  | No provision for IPPs |
| Sierra Leone | Vertically integrated | Public | National Power Authority (NPA) |  |  |
| Somalia | Vertically integrated – but NEC only covers small area. Rest covered by decentralized private generation and distribution companies | Public/private partnership | Nugal Electrical Co-operative (NEC) |  |  |
| South Africa | Vertically integrated with municipalities playing key role in distributing at local level | Public (converted into public company in 2002) | Eskom |  | Allowed IPPs from 2003 |
| Sudan | Vertically integrated | Public | National Electricity Corporation of Sudan (NEC) |  | Electricity Law of 2000 – opened up electricity sector for private sector in generation, transmission and distribution |
| South Sudan | Vertically integrated | Public | Southern Sudan Electricity Corporation |  |  |
| Swaziland | Vertically integrated | Public | Swaziland Electricity Company (SEC) |  | Energy Regulatory Act 2007 deregulated energy sector |
| Tanzania | Vertically integrated | Public | Tanzanian Electric Supply Company Limited (TANESCO) | Former management contract with Net Group Solutions (South Africa) | Electricity Act 2008 liberalized electricity geneation, transmission and distribution sector. |
|  | IPPs |  | IPPs: AES then Globeleq (Songas Plant); Independent Power Tanzania (IPTL) wholly owned by Mechmar |  |
| Togo | Distribution and sale of electricity in Togo | Public – owned by government of Togo | Togolese Electricity Company (CEET) |  |  |
|  | Integrated generation and transmission | Public – owned by governments of Togo and Benin | Benin Electricity Community (CEB) |  |  |
| Tunisia | Vertically integrated | Public | Societe Tunisienne d'Electricite et du Gaz (STEG) |  | 1996 - liberalisation of energy market |
|  | IPPs |  | Carthage Power Company (CPC) (Rades);Societe d'Electricite d'El Bibane (SEEB) |  |
| **Country** | **Vertically integrated?** | **Public or private?** | **Name of public entities** | **Name of private companies** | **Sector structured to allow private sector involvement?** |
| Uganda | Generation, transmission and distribution split 2001 | Generation = public with 20-year concession | UEGCL (Uganda Electricity Generation Company Ltsd) = owns the assets | Eskom (South Africa) | Yes |
|  | IPPs |  | IPPs: Jacobson Elektro (Namanve Power Plant); Sithe Global (Bujagali Hydropower); Electro-Maxx Limited (Tororo Power Station) |  |
|  | Transmission = public | Uganda Electriicty Transmission Company Ltd (UETCL) |  |  |
|  | Distribution = concession |  | UMEME |  |
| Zambia | Vertically integrated | Public | Zambia Electricity Supply Corporation (ZESCO) |  | Privatisation of ZESCO was successfully resisted |
|  |  | Private co in Copper belt responsible for transmission, distribution in the copper-belt |  | Copperbelt Energy Corporation PLC (CEC) |  |
|  |  | IPP |  | Lunsemfwa Hydro Power Corporation  |  |
| Zimbabwe | Holding company with two subsidiaries | Public | Zimbabwe Electricity Supply Authority Holdings (ZESA) with two subsidiaries - Zimbabwe Power Company (ZPC) and Zimbabwe Electricity Transmission and Distribution Company (ZETDC) |  | Electricity Act of 2002 unbundled ZESA into the two successor companies. IPPs allowed, but ZESA, ZPC and ZETDC still dominant. |

1. **Appendix two: Private companies involved in management contracts and concessions**

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| --- | --- | --- | --- | --- | --- | --- |
| **Company/****Consortium** | **Country of origin and other info** | **Countries where co present** | **Buy out, Concession, management**  | **Project name or Concession name** | **Other companies involved in contract/concession** | **Comments** |
| Actis | UK company | Uganda | Concession Distribution  | UMEME |  |  |
| AES Sonel | Cameroon | Cameroon | AES bought 56% of share capital of SONEL. Went with 20 year concession for distribution, transmission and generation | AES Sonel | AES (United States) = 56% |  |
| Aguas de Portugal | Portuguese | Cape Verde  | Bought majority shares in vertically integrated state owned electricity utility | ELECTRA |  | Sold shares back to Cape Verde government in 2005 and 2008. No longer involved |
| Copperbelt Energy Corporation PLC (CEC) | Zambian | Zambia | Ownership (took over when Zambian Mining conglomerate was privatised) |  | Zambian Energy Corporation = 52%; ZCCM-IH = 20%; Individual shareholders = 15.8%; African Life Financial Services Zamiba Limited - managed fund = 7.2%; Copperbelt Energy Corporation Employees Share Ownership Plan = 5% |  |
| Eskom | South Africa | Uganda | Concession (generation) | Nalubaale and Kiira |  |  |
| Finagestion | France; was wholly owned subsidiary of Bouygues. B now only has minority interest; sold majority interest to ECP (Emergiing Capital Partners) | Cote D'Ivoire; put in tender in Nigeria | Cote d'Ivoire = concession; Nigeria = buyout for distribution company | Cote d’Ivoire = Compagnie Ivoirienne d'Electricite (CIE) | ECP (Emerging Capital Partners); CDC has also invested in Finagestion |  |
| Global Management Systems (GMS) | German | Gambia | Management contract | NAWEC |  |  |
| Infinsa | Spanish company | Equatorial Guinea | PPP | Sociedad de Electricidad de Guinea Ecuatorial (SEGESA) | Government of Equatorial Guinea = 62%; Infinsa = 38% |  |
| IPS West Africa |   | Mali | Partial sale | Energie du Mali (EDM-SA) | SAUR International was initially involved (2000); but in 2005 sold its shares to government of MaliIPS West Africa holds 34% |  |
| Manitoba Hydro | Canadian | Kenya | Management contract with KPLC - ended 2008 |  |  | Ran from 2006 – 2008 |
| Nigeria | Management contract to run national transmission company |  |  | Started 2012 |
| SAUR (SEE FINAGESTION) | France | Cote D'Ivoire | Concession (vertically integrated monopoly) | Compagnie Ivoirienne d'Electricite (CIE) | EDF (French) and Cote d'Ivoire government | Bouygues sold SAUR except for Africa contracts. These were taken over by Finagestion, initially a subsidiary of Bouygues, now majority owned by ECP |
| Suez Environment | French | Morocoo | Concession | Lydec-Casablanca | Fipar Holding (group CDG); RMA Watanya; free float in the Casablanca stock exchange |  |
| Turn-Key Energy - focuses on renewable energy sources | USA | Djibourti | PPPThis is a PPP set up for renewable energy in May 2012 | Djibouti Power Lighting (DJPL) |  | DJPL is hoping to sell lot of electricity to Camp Lemonier (USA navy base) |
| Veolia | French | Chad | Mangement contract For vertically integrated utility, National Electricity Company (NIS) | Vivendi/Dietsmann | Dietsmann | Because of profitiabilty problems, Vivendi (now Veolia) pulled out four months into the second phase of the contract in 2004. |
| Veolia | French | Gabon | Concession - 20 yearsTo take over vertically integrated state utility, SEEG | SEEG (Societie d'Electricite et d'Eaux |  |  |
| Veolia Enviornment Maroc | French | Morocco | ConcessionDistribution | Redal - Rabat/Sale |  | Redal is a subsidiary of Veolia and manages these contracts for Veolia |
| Veolia Enviornment Maroc | French | Morocco | ConcessionDistribution | Amendis - Tetouan and Tangiers  |  | Amendis is 100% owned by Veolia and manages contract for Veolia |

1. **Appendix three: Private companies involved in IPPs**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Project**  | **Companies/equity partners** | **Home of company** | **% owned** | **Start** | **No yrs** | **Comments** |
| Kenya | Iberafrica | Union Fenosa | Spain | 80% |  |  |  |
| KPLC Pension Fund | Kenya | 20% (since 1997) |
| Kenya | OrPower4 | Ormat | Israel | 100% |  |  | First PPA signed for 20 yearsIn April 2011, Ormat signed a 20-year PPA amendment KPLC which will see KPLC buy 36MW from new plant to be constructedOrmat is one of the five leading turbine manufacturers globally.[[158]](#endnote-158) |
| Kenya | Tsavo | Duke Energy  | USA | 49.9% |  |  |  |
| CDC/Globeleq | UK | 30% |
| Wartsila | Finland | 15% |
| IFC |  | 5% |
| Kenya | Rabai | Aldwych | UK | 34% |  |  |  |
| BWSC | Danish, but owned by Mitsui of Japan | 25.5% |
| FMO | Dutch Development Bank | 20% |
| IFU  | Danish bilaterial lender | 20% |
| Tanzania | IPTL | Mechmar  | Malaysia | 70% |  |  |  |
| VIP | Tanzania | 30% |
| Tanzania | Songas | Globeleq | UK | Majority |  |  |  |
| Tanesco |  |  |
| TPDC |  |  |
| Uganda | Namanve Power Plant/Jacobsen Uganda Power Plant Ltd | Jacobson Elektro | Norway | 100% |  |  | Jacobson is constructing Nzizi power plant which it will then operate. It will use natural gas and heavy fuel oil. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Project**  | **Companies/equity partners** | **Home of company** | **% owned** | **Start** | **No yrs** | **Comments** |
| Uganda | Bujagali Hydropower | Sithe GlobalIPS/Aga KhanGovernment of Uganda | USA | 58%32%10% |  |  | Early controversy around this project, when AES who was meant to build it, abandoned it in 2003. Sithe Global and the Aga Khan’s IPS Ltd then came on board. July 2012: plant will be fully commissioned and delivering 250MW to national grid. According to the government this means no power outages for at least the next two years.[[159]](#endnote-159) |
| Uganda | Tororo Power Station | Electro-Maxx Limited | Uganda (1st local IPP in Uganda) |  |  |  | Able to produce 18MW it is being upgraded to produce 50MW by mid-2012 |
| Cote D’Ivoire | CIPREL | Bouygues/Finagestion | French | 98% |  |  |  |
| BOAD | West African Development Bank (BOAD) | 2% |
| Cote D’Ivoire | Azito | Cinergy | Swiss/French | 65.7% |  |  | 2010 Globeleq acquires additional interest in Azito. 2011 - signs concession agreement for Azito to expand and convert to more efficient generation facility and increase capacity. |
| CDC/Globeleq | UK | 11% |
| IPS |  | 23% |
| Ghana | Takoradi II | TAQA | UAE | 90% |  |  | 2010 MOU between TAQA and gov/VRA for 110 MW expanstion of plant |
| VRA | Ghana | 10% |
| Ghana | Sunon Asogli Power Plant | Shenzhen | China | 60% |  |  |  |
| China-African Development Fund (CADFUND) |  | 40% |
| Ghana | Bui Hydro | Sinohydro | China | 100% |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Project**  | **Companies/equity partners** | **Home of company** | **% owned** | **Start** | **No yrs** | **Comments** |
| Nigeria | AES Barge Limited | AES | USA | 95% |  |  | Intially owned by Enron - deal formed part of prosecution for fraud of Enron executives in USA. Costly. In arbitration. |
| YFP | Nigeria | 5% |
| Nigeria | Okpai | Nigerian National Petroleum Corporation | Nigeria | 60% |  |  |  |
| Nigerian Agip Oil Company | Italy | 20% |
| Phillips Oil Company | USA | 20% |
| Nigeria  | Afam IV | NNPC | Nigeria | 55% |  |  |  |
| Shell | UK/Netherlands | 30% |
| Elf (Total) | France | 10% |
| Agip | Italy | 5% |
| Nigeria | Aba Integrated power project | Geometric Power Limited | Nigeria | 100% |  |  | Current Minister of Power was founder of Geometric |
| Senegal | GTi Dakar | GE Capital Structured Finance Group (SFG) | USA |  |  |  |  |
| IFC |  |
| Edison | Italy |
| Senegal | Kounoune I | Mitsubishi  | Japan |  |  |  |  |
| Matelec S.A.L | Lebanon |
| Togo | Extension of CTL | Contour Global | USA | 80% |  |  |  |
|  | IFC | 20% |
| Algeria | Arzew IWPP | AEC (Algerian Energy Company) | Algeria | 95% | 2005 | 25 |  |
| Black and Veatch |  | 5% |
| Algeria | Shariket Kahraba Hadjiret En Nouss S.p.A. (Hadjiret En Nouss) | Algerian Utilities International Limited (51% owned by SNC-Lavalin and 49% by Mubadala Development Company) | Algeria | 51% | 2009 | 20 | Shariket Kahraba Hadjret En Nouss S.p.A. (S.K.H. S.p.A.) = formed in 2006.Owned 26% by SNC-Lavalin (Canadian) through ownership structured as in previous columns |
| Sonatrach; Sonelgaz; Algerian Energy Company | Algeria (all state companies) | 49% |
| Algeria | Skikda IPP | SNC-Lavalin | Canadian | 25% | 2006 | 12 |  |
| Sonatrech, Sonelgaz and Algerian Energy Company |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Project**  | **Companies/equity partners** | **Home of company** | **% owned** | **Start** | **No of yrs** | **Comments** |
| Zambia | Lunsemfwa Hydro Power Corporation | Agua Imara (owned by SN Power (Norway) | Norway | 51% |  |  |  |
| Morocco | Tetouan Wind Power Project | Theolia | French | 100% | 1997 | 20 |  |
| Morocco | Tahaddart – EET (Energie Electrique de Tahaddart) | Endesa | Spanish | 32% | 2003 |  |  |
| Morocco | Jorf Lasfar Energy Company (JLEC) | TAQA (Abu Dhabi National Energy Company)  | UAE | 100% | 1997 | 30 |  |
| Tunisia | Rades II – Carthage Power Company (CPC) | BTU Power Company  |  | 60% | 2002 | 20 | CPC - special purpose company set up to own and operate Rades; BTU Power Company has controlling. interest, and also operates plant through BTU STEAG O & M Service Company |
| Marubeni | Japanese | 40% |
| Tunisia | SEEB | Caterpillar  | USA | 50% | 2003 | 20 |  |
| Candax |  | 50% |
| Egypt | Port Said | TanjongAugust 2012 sold to 1Malaysia Development Bhd | Malaysian | 100% |  |  |  |
| Egypt | Sidi Krir | TanjongAugust 2012 sold to 1Malaysia Development Bhd | Malaysian | 100% |  |  |  |
| Egypt | Suez Gulf | TanjongAugust 2012 sold to 1Malaysia Development Bhd | Malaysian | 100% |  |  |  |

*Information drawn from Eberhard, A & Gratwick, K N (2010) IPPs in Sub-Saharan Africa: determinants of success. USGB, Cape Town; REEGLE website; PSIRU database*

**References:**

Africa Review (September 2011) “Power dams look to keep lights on in Africa” [http://www.africareview.com/Analysis/African+dams+offer+hope+to+dimming+lights/-/979190/982260/-/91ysigz/-/index.html](http://www.africareview.com/Analysis/African%2Bdams%2Boffer%2Bhope%2Bto%2Bdimming%2Blights/-/979190/982260/-/91ysigz/-/index.html)

Bayliss, K (2008) Water and electricity in sub-Saharan Africa in Bayliss, K & Fine, B (eds) Privatisation and alternative public sector reform in sub-Saharan Africa: Delivering on electricity and water. Basingstoke: Palgrave Macmillan

Bayliss, K & McKinley, T (2007) Privatising basic utilities in sub-Saharan Africa: the MDG impact. Policy Research Brief No 3. International Poverty Centre & United Nations Development Programme.

Bloomberg New Energy Finance (2011) Global Renewable Energy Market Outlook. Executive Summary. 16 November 2011.

Climate Focus/GPPI (2011) Towards an energizing partnership? Exploring China’s role as catalyst of renewable energy development in Africa.

Climate Investment Funds (2009) Clean Technology Fund: Investment Plan for Concentrated Solar Power in the Middle East and North Africa Region <http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/mna_csp_ctf_investment_plan_kd_120809.pdf>

Controller and Auditor General Tanzania (2008) “Annual General Report : On the financial statements of the Public Authorities and Other Bodies for the financial year 2007/2008” <http://www.parliament.go.tz/bunge/docs/reports/1251958326.pdf>

Eberhard, A; Gratwick, K N (2010) IPPs in sub-Saharan Africa: determinants of success. USGB. Cape Town

Eberhard, A; Rosnes, O et al (2011) Africa’s power infrastructure – investment, integration, efficiency. <http://www.infrastructureafrica.org/system/files/Africa%27s%20Power%20Infrastructure.pdf>

Greepeace International, SolarPACES and ESTELA (2009) Concentrating Solar Power: Outlook 2009

Hall, D (2006) Energy privatisation and reform in East Africa. PSIRU

Hall, D (2007) Electrifying Africa: power through the public sector.PSIRU

Hall, D (2010) Public disaster and private gain – the proposed privatisation of electricity in Nigeria. PSIRU

IEA/UNDP/UNIDO (2010) World Energy Outlook: Special early excerpt “Energy Poverty: How to make modern energy access universal?”

KenGen annual report 2011 [http://www.kengen.co.ke/documents/2011%20KenGen%20Annual%20Report%20&%20Financial%20Statements.pdf](http://www.kengen.co.ke/documents/2011%20KenGen%20Annual%20Report%20%26%20Financial%20Statements.pdf)

Kenya (2012) Draft National Energy Policy. Released May 11 2012. <http://www.energy.go.ke/wp-content/uploads/2010/08/National%20Energy%20Policy%20-%20Third%20Draft%20-%20May%2011%202012.pdf>

Nile Basin Discourse “The Rusumo Hydropower Project Policy Brief” <http://www.nilebasindiscourse.org/index.php/e-resource-center/cat_view/132-policy-briefs.html>

Price Waterhouse Cooper. 100% Renewable Electricity: A Roadmap to2050 for Europe and North Africa. <http://www.pwc.co.uk/pdf/100_percent_renewable_electricity.pdf>

Ren 21 (2011) Renewables 2011 Global Status Report

Ren21 (2012) Renewables 2012 Global Status Report.

UNDP (2012) Africa Human Development Report 2012: towards a food secure future. <http://www.undp.org/content/dam/undp/library/corporate/HDR/Africa%20HDR/UNDP-Africa%20HDR-2012-EN.pdf>

Van Niekerk, S (2010) Desertec: what are the implications for Africa? PSIRU

World Bank/AFD (2010) Africa’s Infrastructure. [http://www.infrastructureafrica.org/aicd/system/files/AIATT \_ Consolidated\_smaller.pdf](http://www.infrastructureafrica.org/aicd/system/files/AIATT%20_%20Consolidated_smaller.pdf)

World Bank (2008) Building bridges: China’s growing role as infrastructure financier for Sub-Saharan Africa. <http://siteresources.worldbank.org/INTAFRICA/Resources/BB_Final_Exec_summary_English_July08_Wo-Embg.pdf>

World Bank (December 2011) *Kenya - Private Sector Power Generation Support Project*. Washington D.C. - The World Bank. <http://documents.worldbank.org/curated/en/2011/12/15623581/kenya-private-sector-power-generation-support-project>

1. **Notes:**
1. UNDP (2012) pg. v [↑](#endnote-ref-1)
2. IEA, (2010) Energy poverty: how to make modern energy access universal? Excerpt of World Energy Outlook 2010 [↑](#endnote-ref-2)
3. IEA/UNDP/UNIDO (2010) World Energy Outlook: Special early excerpt “Energy Poverty: How to make modern energy access universal?” pg. 11 [↑](#endnote-ref-3)
4. See <http://www.iea.org/weo/electricity.asp> [↑](#endnote-ref-4)
5. International Bank for Reconstruction and Development and World Bank (2010) Africa’s Infrastructure. [http://www.infrastructureafrica.org/aicd/system/files/AIATT \_ Consolidated\_smaller.pdf](http://www.infrastructureafrica.org/aicd/system/files/AIATT%20_%20Consolidated_smaller.pdf) [↑](#endnote-ref-5)
6. International Bank for Reconstruction and Development and World Bank (2010) Africa’s Infrastructure. [http://www.infrastructureafrica.org/aicd/system/files/AIATT \_ Consolidated\_smaller.pdf](http://www.infrastructureafrica.org/aicd/system/files/AIATT%20_%20Consolidated_smaller.pdf) [↑](#endnote-ref-6)
7. Source: <http://www.reegle.info/countries> [↑](#endnote-ref-7)
8. United Nations Mission in the DRC (May 2008) “Strategies for the development of the electricity sector” <http://allafrica.com/stories/200805270006.html> [↑](#endnote-ref-8)
9. Eberhard, A; Rosnes, O et al (2011) pg. 1 [↑](#endnote-ref-9)
10. Africa Review (September 2011) “Power dams look to keep lights on in Africa” [http://www.africareview.com/Analysis/African+dams+offer+hope+to+dimming+lights/-/979190/982260/-/91ysigz/-/index.html](http://www.africareview.com/Analysis/African%2Bdams%2Boffer%2Bhope%2Bto%2Bdimming%2Blights/-/979190/982260/-/91ysigz/-/index.html) [↑](#endnote-ref-10)
11. IPS (21 September 2011) “No water, no management, no power” <http://www.ips.org/africa/2011/09/dr-congo-no-water-no-management-no-power-2/> [↑](#endnote-ref-11)
12. <http://www.rnw.nl/africa/article/drc-frustrations-over-power-cuts-take-a-political-turn> [↑](#endnote-ref-12)
13. See [http://www.africareview.com/News/Senegal+rioters+set+government+buildings+on+fire/-/979180/1190556/-/ilj6xv/-/index.html](http://www.africareview.com/News/Senegal%2Brioters%2Bset%2Bgovernment%2Bbuildings%2Bon%2Bfire/-/979180/1190556/-/ilj6xv/-/index.html) [↑](#endnote-ref-13)
14. See: [http://www.africareview.com/News/Chaos+as+police+break+up+Niger+power+cut+demos/-/979180/1211996/-/6v11r2z/-/index.html](http://www.africareview.com/News/Chaos%2Bas%2Bpolice%2Bbreak%2Bup%2BNiger%2Bpower%2Bcut%2Bdemos/-/979180/1211996/-/6v11r2z/-/index.html) and <http://af.reuters.com/article/topNews/idAFJOE60P0OI20100126> [↑](#endnote-ref-14)
15. <http://www.reegle.info/countries/kenya-energy-profile/KE> [↑](#endnote-ref-15)
16. Draft National Energy Policy pg. 71 [↑](#endnote-ref-16)
17. Business Daily (November 2011) Country power restructuring pays off with Sh5 billion loan. <http://allafrica.com/stories/201111030608.html> [↑](#endnote-ref-17)
18. Draft National Energy Policy pg. 24 [↑](#endnote-ref-18)
19. Draft National Energy Policy pg. 69 [↑](#endnote-ref-19)
20. The Star (20 May 2012) KenGen to construct Sh 57 billion power plant. <http://www.the-star.co.ke/business/local/76644-kenyas-kengen-eyes-686-mln-gas-fired-power-plant> [↑](#endnote-ref-20)
21. Reuters (November 2011) Kenya to start work on new geothermal plant. <http://www.reuters.com/article/2011/11/01/us-kenya-kengen-idUSTRE7A03IA20111101> [↑](#endnote-ref-21)
22. Business Daily (October 2011) Kenya power defies gloomy outlook to post profit growth. <http://allafrica.com/stories/201110190045.html> [↑](#endnote-ref-22)
23. IPS (April 2012) “Kenya: Nation ‘becoming economic heartbeat of continent”
<http://allafrica.com/stories/201204250236.html> [↑](#endnote-ref-23)
24. The Star (29 April 2012) Atwoli calls for merger of KPLC and Kengen <http://www.the-star.co.ke/national/national/73453-atwoli-calls-for-merger-of-kplc-and-kengen> [↑](#endnote-ref-24)
25. Business Daily (January 2012) Kenya: Short rains hand power users Sh2 billion bill relief. <http://allafrica.com/stories/201201110285.html> [↑](#endnote-ref-25)
26. Business Daily (October 2011) Kenya power defies gloomy outlook to post profit growth. <http://allafrica.com/stories/201110190045.html> [↑](#endnote-ref-26)
27. Business Daily (February 2012) Kenya: power raises fuel cost charge as water levels fall <http://allafrica.com/stories/201202131239.html> [↑](#endnote-ref-27)
28. World Bank (December 2011) *Kenya - Private Sector Power Generation Support Project*. Washington D.C. - The Worldbank. <http://documents.worldbank.org/curated/en/2011/12/15623581/kenya-private-sector-power-generation-support-project> [↑](#endnote-ref-28)
29. See the third draft of the National Energy Policy, released May 11 2012. <http://www.energy.go.ke/wp-content/uploads/2010/08/National%20Energy%20Policy%20-%20Third%20Draft%20-%20May%2011%202012.pdf> [↑](#endnote-ref-29)
30. KenGen annual report 2011 [http://www.kengen.co.ke/documents/2011%20KenGen%20Annual%20Report%20&%20Financial%20Statements.pdf](http://www.kengen.co.ke/documents/2011%20KenGen%20Annual%20Report%20%26%20Financial%20Statements.pdf) [↑](#endnote-ref-30)
31. <http://www.reegle.info/countries/kenya-energy-profile/KE#renewable_energy> [↑](#endnote-ref-31)
32. IPS (April 2012) “Kenya: Nation ‘becoming economic heartbeat of continent”
<http://allafrica.com/stories/201204250236.html> [↑](#endnote-ref-32)
33. See <http://ltwp.co.ke/consortium> [↑](#endnote-ref-33)
34. The Star (20 May 2012) KenGen to construct Sh 57 billion power plant. <http://www.the-star.co.ke/business/local/76644-kenyas-kengen-eyes-686-mln-gas-fired-power-plant> [↑](#endnote-ref-34)
35. Capital FM (June 2012) Kenya Power signs out Sh1b contract”

<http://allafrica.com/stories/201206140990.html> [↑](#endnote-ref-35)
36. The Star (2012) World Bank to fund slum electrification project.
<http://allafrica.com/stories/201206050855.html> [↑](#endnote-ref-36)
37. See <http://www.worldbank.org/projects/P122671/partial-risk-guarantees-ipps-kenya?lang=en> [↑](#endnote-ref-37)
38. East African Business Week (Kampala) “Tanzania, U.S. Firm Sign Power Pact” 20 June 2011 [↑](#endnote-ref-38)
39. Controller and Auditor General Tanzania “Annual General Report : On the financial statements of the Public Authorities and Other Bodies for the financial year 2007/2008” pg. 108 <http://www.parliament.go.tz/bunge/docs/reports/1251958326.pdf> [↑](#endnote-ref-39)
40. Controller and Auditor General Tanzania “Annual General Report : On the financial statements of the Public Authorities and Other Bodies for the financial year 2007/2008” pg. 66/67 <http://www.parliament.go.tz/bunge/docs/reports/1251958326.pdf> [↑](#endnote-ref-40)
41. Source: <http://www.reegle.info/countries/TZ> [↑](#endnote-ref-41)
42. Tanzania Daily News (17 May 2012) Muhongo sets power access targets. <http://allafrica.com/stories/201205170034.html> [↑](#endnote-ref-42)
43. Tanzania Daily News (17 January 2012) Tanzania: Bunge Team summons Tanesco, Ewura over new power tariffs. <http://allafrica.com/stories/201201180642.html>  [↑](#endnote-ref-43)
44. The Citizen (21 January 2012) Tanesco seeks Sh408 billion loan from local banks. <http://allafrica.com/stories/201201231479.html> [↑](#endnote-ref-44)
45. Tanzania Daily News (27 July 2012) ‘Tanesco does not need subsidy” <http://allafrica.com/stories/201207270517.html> [↑](#endnote-ref-45)
46. Tanzania Daily News (15 July 2012) ‘Tanesco DG suspended’ <http://allafrica.com/stories/201207161575.html>  [↑](#endnote-ref-46)
47. Daily Trust (18 October 2011) We have 8000MW but can only generate 4000MW – Nnaji

<http://allafrica.com/stories/201110180435.html> [↑](#endnote-ref-47)
48. Leadership (19 April 2012) Nigeria: Power – FG unveils emergency gas supply plan. <http://allafrica.com/stories/201204190388.html> [↑](#endnote-ref-48)
49. See Leadership U.S. $100 billion needed to generate 40 000 MW by 2020 - Nnaji <http://allafrica.com/stories/201203050409.html> and Daily Trust (14 June 2012) Power sector needs U.S.$500 billion – NERC <http://allafrica.com/stories/201206140592.html> [↑](#endnote-ref-49)
50. This Day (12 June 2012) Nigeria: Power sector privatisation, labour unions and matters arising.
<http://allafrica.com/stories/201206120525.html> [↑](#endnote-ref-50)
51. This Day (5 March 2012) Onyemelukwe – privatisation review of power companies inevitable. <http://allafrica.com/stories/201203051239.html> [↑](#endnote-ref-51)
52. See <http://ccs.ukzn.ac.za/default.asp?2,40,5,2666> [↑](#endnote-ref-52)
53. See This Day (18 January 2012) Power reform – new electricity tariff out next month. [http://allafrica.com/stories/201201191124.html](http://allafrica.com/stories/201201191124.htmlT) and This Day (18 October 2011) Power – Nnaji seeks U.S. $50 billion support from capital market. <http://allafrica.com/stories/201110180509.html> [↑](#endnote-ref-53)
54. This Day (30 October 2011) PHCN rips consumers of N240 billion annually. <http://allafrica.com/stories/201110311174.html> [↑](#endnote-ref-54)
55. Leadership (5 august 2011) “Privatisation hasn’t benefitted the country – Jonathan” <http://allafrica.com/stories/201108081375.html> [↑](#endnote-ref-55)
56. See Hall, D (2010) Public disaster and private gain – the proposed privatisation of electricity in Nigeria. PSIRU [↑](#endnote-ref-56)
57. This Day (1 November 2011) A win-win source of plugging funding gap in power sector. http://allafrica.com/stories/201111010553.html [↑](#endnote-ref-57)
58. Hall, D (2007) Electrifying Africa: power through the public sector. PSIRU [↑](#endnote-ref-58)
59. Ocnus.Net (March 13 2010) Burkina stops water, electricity privatisation. <http://www.ocnus.net/artman2/publish/Africa_8/Burkina-Stops-Water-Electricity-Privatisation.shtml> [↑](#endnote-ref-59)
60. World Bank/AFD (2010) Africa’s Infrastructure. Pg. 111 [↑](#endnote-ref-60)
61. World Bank/AFD (2010) Africa’s Infrastructure Pg. 115 [↑](#endnote-ref-61)
62. World Bank/AFD (2010) Africa’s Infrastructure. Pg. 111 [↑](#endnote-ref-62)
63. Eberhard, A; Gratwick, K N (2010) IPPs in sub-Saharan Africa: determinants of success [↑](#endnote-ref-63)
64. Eberhard, A; Rosnes, O; Shkeraton, M; Vennerno, H (2011) pg. 81 [↑](#endnote-ref-64)
65. Eberhard, A & Gratwick, K N (2010) IPPs in Sub-Saharan Africa: determinants of success. USGB, Cape Town. [↑](#endnote-ref-65)
66. Research and Markets (September 2009) Strategic analysis of the electricity markets in Ivory Coast, Senegal and Equatorial Guinea <http://www.researchandmarkets.com/research/f6ff04/strategic_analysis> [↑](#endnote-ref-66)
67. Eberhard, A; Rosnes, O; Shkeraton, M; Vennerno, H (2011) pg. 8 [↑](#endnote-ref-67)
68. “Power rationing to ease slightly” (5September 2011) <http://www.ippmedia.com/frontend/?l=33000> [↑](#endnote-ref-68)
69. Aggreko inaugurates ground breaking project to supply 107.5 MW of power to South Africa and Mozambique <http://www.aggreko.co.za/news-events/press-releases/power-plant-south-africa/?en-ZA> [↑](#endnote-ref-69)
70. Eberhard, A; Rosnes, O; Shkeraton, M; Vennerno, H (2011) pg. 8 [↑](#endnote-ref-70)
71. <http://mobile.monitor.co.ug/News/-/691252/1380452/-/format/xhtml/-/11shu68/-/index.html> [↑](#endnote-ref-71)
72. ECP (10 December 2010) Finagestion: Increasing access to drining water for the poor in Senegal. <http://www.ecpinvestments.com/news/2550.xml> [↑](#endnote-ref-72)
73. <http://www.bouygues.com/en/group/corporate-governance/corporate-management/olivier-bouygues-2/> [↑](#endnote-ref-73)
74. See <http://www.groupecie.net/decouvrir/repartition_capital.php> [↑](#endnote-ref-74)
75. <https://s3.amazonaws.com/files3.peopleperhour.com/uploads/portfolioItems/Portfolio-245892-Sample_Translation_2_TT.pdf> [↑](#endnote-ref-75)
76. The Cornerhouse (2012) Bricks and Mortars pg. 33 [↑](#endnote-ref-76)
77. PR Newswire (December 2 2009) Emerging capital partners invests in West African utilities infrastructure company. <http://www.prnewswire.co.uk/news-releases/emerging-capital-partners-invests-in-west-african-utilities-infrastructure-company-152835675.html> [↑](#endnote-ref-77)
78. ECP Investments (4 November 2009) ECP Acquires Majority of Finagestion. <http://www.ecpinvestments.com/news/1891.xml> [↑](#endnote-ref-78)
79. <http://www.cdcgroup.com/From-cote-dIvoire.aspx> [↑](#endnote-ref-79)
80. <http://www.thecornerhouse.org.uk/resource/inquiry-2009-2010-annual-report-and-account-uks-department-international-development> [↑](#endnote-ref-80)
81. The Guardian (27 February 2012) James Ibori pleads guilty to fraud and money-laundering charges. <http://www.guardian.co.uk/global-development/2012/feb/27/james-ibori-pleads-guilty-fraud> [↑](#endnote-ref-81)
82. See <http://www.counterbalance-eib.org/?p=1774> [↑](#endnote-ref-82)
83. See The Corner House memorandum “International Development Committee: Inquiry into the Department for International Development’s Annual Report, DFID in 2009-10” <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/CornerHouseOloko.pdf> [↑](#endnote-ref-83)
84. Africa News (November 2 2011) Power distribution – Proglobal Partners US, French firms. [↑](#endnote-ref-84)
85. <http://proglobalpower.com/index.php/9-latest-news/1> [↑](#endnote-ref-85)
86. This Day (3 August 2012) Power privatisation – Rockson, masters energy top bidders’ list. <http://allafrica.com/stories/201208030253.html> [↑](#endnote-ref-86)
87. <http://transcorpnigeria.com/our-company/company.html> [↑](#endnote-ref-87)
88. Vanguard (20 July 2012) PHCN – Transcorp, others beat deadline [↑](#endnote-ref-88)
89. For a full discussion of the Dowans corruption case and the subsequent ruling against Tanesco by the ICC, see <http://www.psiru.org/reports/tanzania-corruption-energy-sector> [↑](#endnote-ref-89)
90. The Observer (4 December 2011) Ugandans worse off under Umeme – MPs <http://www.observer.ug/index.php?option=com_content&view=article&id=16169:ugandans-worse-off-under-umeme--mps&catid=34:news&Itemid=114> [↑](#endnote-ref-90)
91. The Observer (June 6 2012) Energy probe splits MPs <http://observer.ug/index.php?option=com_content&task=view&id=19124&Itemid=116> [↑](#endnote-ref-91)
92. The Observer (23 November 2012) Umeme contract: negotiators keep distance <http://www.observer.ug/index.php?option=com_content&task=view&id=16007&Itemid=68> [↑](#endnote-ref-92)
93. The Observer (6 September 2012) MPs pass vote of no confidence in Umeme <http://www.observer.ug/index.php?option=com_content&view=article&id=20824:-mps-pass-vote-of-no-confidence-in-umeme&catid=34:news&Itemid=114>  [↑](#endnote-ref-93)
94. Africa News (1 September 2012) Uganda; will invetors want to buy Umeme? [↑](#endnote-ref-94)
95. The Independent (Kampala) Uganda: Umeme records Sh23 Billion net profit.
 <http://allafrica.com/stories/201208221110.html> [↑](#endnote-ref-95)
96. Chimpreports.com (22 August 2012) Umeme profits hit Shs 109bn; electricity thieves warned. <http://www.chimpreports.com/index.php/business/5620-umeme-profits-hit-shs109bn-electricity-thieves-warned.html> [↑](#endnote-ref-96)
97. East African Business Week (Kampala) (25 August 2012) Uganda: Power distributor lacks funds to roll-out pre-paid meters. <http://allafrica.com/stories/201208290057.html> [↑](#endnote-ref-97)
98. The CEO magazine (28 August 2012) Umeme IPO, not as rosy as it looks <http://www.theceomagazine-ug.com/news/umeme-ipo-not-as-rosy-as-it-sounds.html> [↑](#endnote-ref-98)
99. http://allafrica.com/stories/201208240881.html [↑](#endnote-ref-99)
100. See for instance “Aggreko inaugurates ground breaking project to supply 107.5 MW of power to South Africa and Mozambique” <http://www.aggreko.co.za/news-events/press-releases/power-plant-south-africa/?en-ZA> [↑](#endnote-ref-100)
101. World Bank/AFD 2010 Africa’s Infrastructure 2010 [http://www.infrastructureafrica.org/aicd/system/files/AIATT\_Consolidated\_smaller .pdf](http://www.infrastructureafrica.org/aicd/system/files/AIATT_Consolidated_smaller%20.pdf) [↑](#endnote-ref-101)
102. World Bank/AFD 2010 Africa’s Infrastructure 2010 pg. 186 [http://www.infrastructureafrica.org/aicd/system/files/AIATT\_Consolidated\_smaller .pdf](http://www.infrastructureafrica.org/aicd/system/files/AIATT_Consolidated_smaller%20.pdf) [↑](#endnote-ref-102)
103. Allafrica (18 June 2012) Africa: Shaky Infrastructure falls under Washington Spotlight. <http://allafrica.com/stories/201206180090.html> [↑](#endnote-ref-103)
104. Eberhard, A & Gratwick, K N (2010) IPPs in Sub-Saharan Africa: determinants of success. USGB, Cape Town. [↑](#endnote-ref-104)
105. African Development Bank (21 Dec 2010) AfDB invests over Usd 1 Billion in African Energy Projects. <http://allafrica.com/stories/201012211004.html> [↑](#endnote-ref-105)
106. Climate Focus (2011) Towards an energizing partnership? Exploring China’s role as catalyst of renewable energy development in Africa. <http://www.gppi.net/fileadmin/media/pub/2011/conrad-et-al_2011_sino-african-energy-relations.pdf> [↑](#endnote-ref-106)
107. World Bank (2008) Building bridges: China’s growing role as infrastructure financier for Sub-Saharan Africa. <http://siteresources.worldbank.org/INTAFRICA/Resources/BB_Final_Exec_summary_English_July08_Wo-Embg.pdf> [↑](#endnote-ref-107)
108. ESI-Africa.com (13 September 2012) China Finances US$9.3 billion for African hydropower dams. http://www.esi-africa.com/node/13438 [↑](#endnote-ref-108)
109. Times of Zambia (17 May 2012) Zambia: Maamba Thermal Plant Construction Begins. <http://allafrica.com/stories/201205170595.html> [↑](#endnote-ref-109)
110. The New Vision (5 June 2012) Uganda: CWEC should get the Karuma Project <http://allafrica.com/stories/201206051176.html>  [↑](#endnote-ref-110)
111. World Bank (2008) Building bridges: China’s growing role as infrastructure financier for Sub-Saharan Africa. <http://siteresources.worldbank.org/INTAFRICA/Resources/BB_Final_Exec_summary_English_July08_Wo-Embg.pdf> [↑](#endnote-ref-111)
112. ESI-Africa.com (13 September 2012) China Finances US$9.3 billion for African hydropower dams. http://www.esi-africa.com/node/13438 [↑](#endnote-ref-112)
113. Climate Focus (2011) Towards an energizing partnership? Exploring China’s role as catalyst of renewable energy development in Africa. <http://www.gppi.net/fileadmin/media/pub/2011/conrad-et-al_2011_sino-african-energy-relations.pdf> [↑](#endnote-ref-113)
114. Africa and Europe in partnership website <http://www.africa-eu-partnership.org/articles/about-aeep> [↑](#endnote-ref-114)
115. See [http://africa-eu-renewables.org/index.php?page=35#](http://africa-eu-renewables.org/index.php?page=35) [↑](#endnote-ref-115)
116. Eberhard A; Rosnes, O; Shkeraton, M; Vennerno, H (2011) [↑](#endnote-ref-116)
117. Bayliss, K (2008) Water and electricity in sub-Saharan Africa in Bayliss, K & Fine, B (eds) Privatisation and alternative public sector reform in sub-Saharan Africa: Delivering on electricity and water. Basingstoke: Palgrave Macmillan [↑](#endnote-ref-117)
118. The Herald (6 June 2012) ZESA acquires 10 000 pre-paid meters. <http://allafrica.com/stories/201206060907.html> [↑](#endnote-ref-118)
119. Ren21 (2012) Renewables 2012 Global Status Report. <http://www.map.ren21.net/GSR/GSR2012.pdf> [↑](#endnote-ref-119)
120. Ren21 (2012) Renewables 2012 Global Status Report pg. 23 [↑](#endnote-ref-120)
121. Ren21 (2012) Renewables 2012 Global Status Report <http://www.map.ren21.net/GSR/GSR2012.pdf> [↑](#endnote-ref-121)
122. Ren21 (2012) Global status report. [↑](#endnote-ref-122)
123. Global Energy Observatory <http://globalenergyobservatory.org/geoid/42509> [↑](#endnote-ref-123)
124. Egypt Independent (17 May 2012) Egyptians discuss response to Ethiopian dam <http://www.egyptindependent.com/news/egyptians-discuss-response-ethiopian-dam> [↑](#endnote-ref-124)
125. Daily Nation on the Web (28 July 2011) UN Calls for suspension of giant Ethiopian Hydropower Dam. <http://allafrica.com/stories/201108030673.html> [↑](#endnote-ref-125)
126. Creamer Media’s Engineering News (10 February 2012) Uganda hydropower plant plan hits funding, technical snags <http://www.engineeringnews.co.za/article/uganda-hydropower-plant-2012-02-10> [↑](#endnote-ref-126)
127. D’Ujanga, Simon (Minister of State for Energy, The Republic of Uganda) (2011) “Challenges and opportunities in the power sector in the East African Region”. [↑](#endnote-ref-127)
128. Nile Basin Discourse “The Rusumo Hydropower Project Policy Brief” <http://www.nilebasindiscourse.org/index.php/e-resource-center/cat_view/132-policy-briefs.html> [↑](#endnote-ref-128)
129. Ren21 (2012) Global Status Report. Pg. 42 [↑](#endnote-ref-129)
130. Ren21 (2012) Global status report p. 49 [↑](#endnote-ref-130)
131. Ren21 (2012) Global Status Report pg 41 [↑](#endnote-ref-131)
132. The Economist (December 18 2008) “Continental Rift: a hot new proposal for ending electricity shortages” <http://www.economist.com/node/12821590> [↑](#endnote-ref-132)
133. Rwanda Focus (March 2012) Geothermal test drilling finally starts in August. <http://allafrica.com/stories/201203051414.html> [↑](#endnote-ref-133)
134. Oilprice.com (February 2012) Rwanda seeks $1 billion geothermal energy investment” <http://oilprice.com/Alternative-Energy/Geothermal-Energy/Rwanda-Seeks-1-Billion-Geothermal-Energy-Investment.html> [↑](#endnote-ref-134)
135. REN21 (2012) Global status report pg. 57 [↑](#endnote-ref-135)
136. Sahara Wind Project “Current Wind Farms Operating in North Africa” <http://www.saharawind.com/index.php?Itemid=55&id=38&option=com_content&task=view&lang=en> [↑](#endnote-ref-136)
137. Africa Review (September 2011) “Power dams look to keep lights on in Africa” [↑](#endnote-ref-137)
138. REN21 (2011) Renewables 2011 Global Status Report pg. 20 [↑](#endnote-ref-138)
139. Africa Review (September 2011) “Power dams look to keep lights on in Africa” [↑](#endnote-ref-139)
140. Hathaway, T & Pottinger, L (2009) “The greatest hydro-rush: the privatisation of Africa’s rivers” In Electric Capitalis (ed) David McDonald. HSRC Press [↑](#endnote-ref-140)
141. The Southern Times (5 March 2010) “Westcor collapses as DRC elbows out regional partners” <http://www.southerntimesafrica.com/article.php?title=Westcor_collapses_as_DRC_elbows_out_regional_partners&id=3771> [↑](#endnote-ref-141)
142. See <http://www.internationalrivers.org/resources/grand-inga-hydroelectric-project-an-overview-3356> and <http://gga.org/analysis/harnessing-the-congo-river-could-light-up-half-of-africa> [↑](#endnote-ref-142)
143. <http://www.euractiv.com/en/energy/integrating-renewables-electricity-grid-linksdossier-494846> [↑](#endnote-ref-143)
144. <http://www.euractiv.com/en/energy/integrating-renewables-electricity-grid-linksdossier-494846> [↑](#endnote-ref-144)
145. <http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/Clean_Technology_Fund_paper_June_9_final.pdf> [↑](#endnote-ref-145)
146. Climate Investment Funds (2009) Clean Technology Fund: Investment Plan for Concentrated Solar Power in the Middle East and North Africa Region <http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/mna_csp_ctf_investment_plan_kd_120809.pdf> [↑](#endnote-ref-146)
147. DII Fact Sheet. <http://www.dii-eumena.com/uploads/media/Dii_factsheet_10-10_EN.pdf> [↑](#endnote-ref-147)
148. Price Waterhouse Cooper. 100% Renewable Electricity: A Roadmap to2050 for Europe and North Africa. <http://www.pwc.co.uk/pdf/100_percent_renewable_electricity.pdf> [↑](#endnote-ref-148)
149. Gunther Oettinger. EU Commissioner for Energy. Energy in the EU from Northern Africa: a realistic option? <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/10/601&format=HTML&aged=O&language=EN&guiLanguage=en> [↑](#endnote-ref-149)
150. Energy from deserts – bringing the Desertec vision into reality. <http://www.dii-eumena.com/fileadmin/Daten/files/Dii_brochure_8_2010_EN_web.pdf> [↑](#endnote-ref-150)
151. Desertec Red Book. <http://www.desertec.org/fileadmin/downloads/desertec-foundation_redpaper_3rd-edition_english.pdf> [↑](#endnote-ref-151)
152. Greepeace International, SolarPACES and ESTELA (2009) Concentrating Solar Power: Outlook 2009. Pg. 69. [↑](#endnote-ref-152)
153. Energy from deserts – bringing the Desertec vision into reality. <http://www.dii-eumena.com/fileadmin/Daten/files/Dii_brochure_8_2010_EN_web.pdf>

Greenpeace International, SolarPACES and ESTELA (2009) Concentrating Solar Power: Outlook 2009. Pg. 69. [↑](#endnote-ref-153)
154. Price Waterhouse Cooper. 100% Renewable Electricity: A Roadmap to2050 for Europe and North Africa. Pg. 70. <http://www.pwc.co.uk/pdf/100_percent_renewable_electricity.pdf> [↑](#endnote-ref-154)
155. Bayliss & McKinley (2007) pg. 1 [↑](#endnote-ref-155)
156. Bayliss & McKinley (2007) pg.1 [↑](#endnote-ref-156)
157. Bayliss, K and Fine B (eds) 2007 “Whither the Privatisation experiment? Electricity and Water Sector Reform in Sub-Saharan Africa” UNDP pg. 354 [↑](#endnote-ref-157)
158. Ren21 (2012) Global Status Report pg. 41 [↑](#endnote-ref-158)
159. Africa News (June 17 2012) Bujagali adds 250MW to National Grid. [↑](#endnote-ref-159)