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by

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# Introduction

The international financial institutions (IFIs) consist of the IMF, the World Bank, and the other regional development banks, principally the Asian Development Bank (ADB), African Development Bank (AfDB), Inter-American Development Bank (IADB), the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD). These institutions provide loans to developing countries, in return for which they expect governments to observe various conditions and follow specific policies. As a result, the IFIs wield great economic and political power over developing countries, including their policies in the electricity sector..

This paper examines:

* The activities of the international financial insitutions (IFIs) as they affect finance for the energy sector, through their preferences for private companies and insistence on eliminating price subsidies
* How investments to extend electricity networks and develop new electricity generation depend largely on public finance
* The annexe includes lists of current IFI projects affecting the energy sector

# IMF: privatisation and withdrawal of energy subsidies

The IMF lends money to countries to help deal with economic crises. A full list of countries with IMF loans is attached as an annexe to this section. The great majority of current IMF loans are with countries in Europe, sub-Saharan Africa and central America. Nearly all countries in east and south-east Asia, and in south America (except Colombia), have a national policy never to seek a loan from the IMF. There have been a number of successful campaigns against countries accepting loans from the IMF: for example, attempts by the IMF to force a loan on Egypt have so far been resisted by strong campaigns.

## Privatisation

In relation to the energy sector, the IMF frequently requires a country to privatise all or part of its energy system. For example, in both Greece and Portugal the IMF (and its partners the EU and the ECB) requires the countries to sell the state-owned electricity companies as part of the agreed conditions for the ‘rescue’ loans.

The IMF, and other IFIs, are now also demanding that countries should remove energy subsidies.

## Energy subsidies

In March 2013 the IMF published and promoted a new report on ‘Energy Subsidy reform’, which argues that all governments should start eliminating these subsidies, because they are ‘too large [for government finances] to bear…. unmanageable and threatening the stability of the economy’. This policy applies to all countries, rich and poor alike. The IMF argues that it would be better to use the money for other purposes, including reducing taxes, and that they encourage excessive consumption of energy and so contribute to climate change. It advises governments to go for a comprehensive reform of the energy sector, strong propaganda, and phased price increases – and then use ‘targeted measures’ to compensate some of the the poor. It also urges ‘depoliticising’ the issue by setting up some automatic mechanism for increasing prices.

* For example, in Tunisia, where the IMF agreed a USD $1.1 billion ‘standby’ arrangement in June 2013, part of the policy document linked to this loan states that the Tunisian government are committed to raising energy prices: “The 2013 budget already included TDN 400 million savings on energy subsidies. Accordingly, we have raised fuel prices (gasoline and diesel) and electricity tariffs in order to achieve the anticipated savings.” [[1]](#endnote-1)

However, the price of energy involves complex judgments about political, social, industrial and economic consequences, not just an automatic solution.

* Increases in energy prices frequently provoke riots. Recent examples include Bulgaria, where a government was forced to resign in early 2013 as a result, as
* An academic study found that if the subsidies on energy prices in China were simply removed, the net effect would be to cut GDP by about 1.6%, employment by 1.4%, and people’s overall welfare by 2.0% - but energy consumption would be reduced. If the current subsidies were reduced by half but redeployed to support food and services and other products, then GDP and employment and welfare would all rise, and energy consumption could still fall.[[2]](#endnote-2)
* In Argentina, and in other countries, state subsidies keep electricity prices low for consumers, but also act as a form of guaranteed prices for the private electricity companies. A campaign led by trade unionists, Moreno, is calling for public control of all energy companies through nationalisation, and cancelation of private concessions, to enable a completely new framework for the sector and its assets.[[3]](#endnote-3)
* In many countries the greatest electricity subsidy is given to aluminium companies, who need huge amounts of electricity for their smelters, and use secret agreements to get prices far lower than ordinary customers. In South Africa, for example, the multinational aluminium company BHP Billiton has been consuming 9% of all the electricity produced in the country, at less than one-fifth of the tariff paid by other consumers. In Australia, the Alcoa company was given a 30-year guarantee of cheap electricity, which cost the government over US $1billion, and consumed about 9% of all electricity in the state of Victoria. Aluminium companies already consume more than 10% of the entire electricity production of Brazil. Reducing or eliminating these subsidies would remove a great burden on the sector. [[4]](#endnote-4)

# World Bank

## Extent of WB energy loans

The World Bank currently finances 532 projects classified as primarily concerned with the energy sector, worth a total of USD $102.8 billion. Parts of some projects cover other sectors, and parts of other projects classified under other sectors also include an energy element, so the overall figures are broadly accurate.

The lending is concentrated in big projects. The largest single project, for a coal-fired power station in South Africa, accounts for over 10% of the total value. 42% of the total value is in the 21 largest projects, each over $1bn., and 61% of the total value in the 50 projects worth more than $0.5bn. The projects are distributed across all regions, with the least number in Latin America.

1. World Bank projects in Energy sector July 2013 (active and pipeline)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Number | % total | Value (USD $million) | % total |
| Total | 532 | 100% | 102,846 | 100% |
|  |  |  |  |  |
| Total> USD $1000m. | 21 | 4% | 42,947 | 42% |
| Total> USD $500m. | 50 | 9% | 62,419 | 61% |
|  |  |  |  |  |
| Africa | 175 | 33% | 33,531 | 33% |
| East Asia and Pacific | 108 | 20% | 17,676 | 17% |
| Europe and central asia | 83 | 16% | 13,331 | 13% |
| Latin America and Caribbean | 65 | 12% | 6,008 | 6% |
| Middle East and North Africa | 38 | 7% | 13,071 | 13% |
| South Asia | 63 | 12% | 19,228 | 19% |

Source: World Bank website <http://www.worldbank.org/projects> and PSIRU calculations

## WB Policies and conditions

The WB’s largest loans are used to (a) fund or guarantee coal-, gas- and oil-fired power stations (b) finance hydroelectric, wind, solar and geothermal generation (c) build transmission lines required for ‘power pool’ trading across national boundaries (d) promote privatisation, liberalisation and unbundling (e) promote increases in energy prices; and to a much lesser extent (f) improvement of distribution systems, or (g) investing in urban or rural extensions of the systems.

### Privatisation, PPPs and liberalisation

Privatisation remains an overt objective of the World Bank and other IFIs. One way in which this is achieved is by defining the loan so it can only be used for private sector development, for example in Turkey and India:

* The WB is lending Turkey $1.9billion through projects for ‘Private Sector Renewable Energy and Energy Efficiency’. The bank states that: “The objective of the Private Sector Renewable Energy and Energy Efficiency Project for Turkey is to help increase privately owned and operated energy production from indigenous renewable sources within the market-based framework of the Turkish electricity market law, enhance energy efficiency, and thereby help reduce greenhouse gas emissions.” Thus the money appears to target renewables and energy efficiency, but in practice only private energy companies can benefit. [[5]](#endnote-5)
* India is receiving $1.2 billion in loans from the WB for ‘Financing Public Private Partnerships (PPPs) in Infrastructure’. The objective is simply to provide finance that the private sponsors would otherwise be unable to raise, and the loans are simply channelled through the public sector India Infrastructure Finance Company Limited (IIFCL) ‘for on-lending to PPP-based infrastructure projects’. The WB itself has identified suitable projects to receive such funding: ‘The pipeline of sub-projects being considered includes selected power, roads, and ports projects’.[[6]](#endnote-6)
* A hydropower and regional power pool WB project in the Senegal river basin, affecting Mali, Mauritania and Senegal, is centered on a PPP, designed as a model that can be copied in other subregions. [[7]](#endnote-7)
* The IFC is the arm of the World Bank which lends only to the private sector. It is responsible for an increasing proportion of loans by the WB group. This means that the IFC is automatically promoting privatisation: “in the cases of Bangladesh and Nepal, private sector projects under the PPCR appear to have been largely driven and designed by the implementing agency, the IFC…. after consultations with private companies and without the participation of target communities, civil society organisations and other stakeholder groups.” Funds to support climate change – the Climate Investment Funds (CIFs) - have also been specifically directed through the IFC as a way of supporting private companies.[[8]](#endnote-8)

### Energy prices

The World Bank also seeks to increase energy prices. For example, in 2012 it approved a very large USD $1.33billion loan to Romania, for policy measures to ‘Improve governance of energy State-owned enterprises and strengthen their fiscal Sustainability’ (and also to reform tax collection, and health spending). This requires the state company Hidroelectrica to sell output through competitive market processes, make the regulator independent of government, and ‘a roadmap for phasing out regulated prices for electricity’. [[9]](#endnote-9)

### Electricity trading and regional ‘power pools’

In Africa, 9 projects worth a total of USD $3.3 billion are devoted to the construction of transmission lines to enable the international commercial trading of electricity by companies who own power stations. The three trading networks are:

* the Southern Africa Power Market,
* the West Africa Power Pool, and
* the Eastern Electricity Highway. [[10]](#endnote-10)

The WB describes the objectives of these projects as ‘infrastructure for private development’, ‘regional integration’ or ‘export development and competitiveness’.

Only one project is concerned partly with expansion of the system, that is the Kenya Electricity Expansion project. This includes financing for 280MW of geothermal generation; transmission lines; ‘institutional development and operational support’; and ‘expansion and upgrading of the distribution network along with the connection of an additional 300,000 customers over the period of 2011-2016’.

# Regional banks and development finance institutions

This section focuses on the Asian, African and Inter-American development banks. In addition there are development banks set up by the EU - the EIB and the EBRD, which cover Europe and its neighbourhood.

There are also other development banks operating in the regions, including CAF – the development bank for Latin America, created in 1950 and owned solely by Latin American countries, it is able to pursue policies independently from the influence of the USA or European countries. For example, in 2013 it agreed to provide financial support for Bolivia for developing the electricity network, waste management services, and public transport.[[11]](#endnote-11)

## Asian Development Bank (ADB)

The ADB has actively promoted unbundling and privatisation of electricity sector throughout the region over the last 20 years. It also now finances expensive long-distance transmission lines to enable electricity trading by the private sector.

* India: ADB has been lending to India since 1986 and has 159 loans that total roughly $24 billion by end-2011. Since 2003, ADB’s lending focused on support for “deepening” the  reforms, continuing to promote PPPs, strengthening transmission & distribution networks and piloting innovative financing mechanisms that benefit the private sector. More recently, ADB utilizes huge multi-tranche financing facility (MFF) loans for ‘power sector improvement’ programs to build transmission and distribution networks (at public expense) to transfer bulk power from IPPs to high-demand areas like Delhi and Mumbai.
*
* Pakistan: Since the 1990s, the ADB, World Bank and IMF have supported the restructuring and privatization of power sector. ADB is lead donor for Karachi Electricity Supply Co (KESC), while WB takes the lead role for Water and Power Development Authority (WAPDA). ADB has also taken the lead in supporting efforts to attract private sector capital into the power sector. More recently,ADB has been providing large multi-tranche financing facility (MFF) loans in support of a new transmission network, and also to finance many wind farm energy producers.

## African Development Bank (AfDB)

The African Development Bank (AfDB) set out its policy priorities in a strategy paper in 2012, which identified “three key areas for action: (i) fostering regional integration, (ii) leveraging resources and (iii) enabling public-private partnerships”.

Details of individual projects can be accessed through <http://www.afdb.org/en/projects-and-operations/project-portfolio/> . Recent examples include:

* $34million loans to support “Public-Private Partnerships (*PPP*) in infrastructure sectors in Nigeria, particularly in power and transport. The Government of Nigeria …seeks to expand growth by involving the private sector through *PPP* projects.”[[12]](#endnote-12)

## Inter-American Development Bank (IDB or IADB)

The Inter-American Development Bank (IDB or IADB) (in Spanish: Banco Interamericano de Desarrollo (BID)) was created is the largest development bank for the Americas region. It works closely with the World Bank, and actively promotes privatisation and liberalisation of public services and utilities, including electricity and gas.

The IADB policy on public utilities, including energy, is still based on a policy paper on energy and water utilities written in 1996 - 17 years ago. It sets out the universal application of the neo-liberal model of unbundling, privatisation, liberalisation and commercialisation, regardless of national democratic decisions. The 1996 states that countries should restructure their electricity sector and change their laws “in order to facilitate various modes of private sector participation”; that public sector utilities should be restructured to have a purely regulatory role, “leaving the service provider with a purely *entrepreneurial* role for either public or privately owned utilities”; that “the development of competition may be achieved …. via *vertical separation* and *horizontal break-up* of the sector”; and that “ the creation of international networks enhances the prospects for competition”. [[13]](#endnote-13)

The IADB changed its lending to fit these policies. Before the 1990s, the IADB lending in the sector consisted of loans to public sector utilities for investment in new electricity generation, distribution or transmission assets. The new policy led to two major changes. [[14]](#endnote-14)

* Firstly, the bank switched its lending away from investment in the electricity system itself, to finance the process of restructuring: “to support structural changes in which electricity-sector reforms figure as an important component.”
* Secondly, it channelled investment finance away from the public sector and towards private companies:“it drastically reduced the number of investment loans made to public power companies and in 1995 started replacing them with direct loans to the private sector issued by the Private Sector Department (PRI).”[[15]](#endnote-15)

But the policy has been a political and technical disaster. A report by the bank’s own evaluation division in 2007 concluded that the evidence contradicted the bank’s assumption that neo-liberal policies would improve the provision of electricity services: “the reforms proposed under the PUP are no longer consistent with the Bank’s and countries’ needs and interests with regard to financing for the electricity sector.”

With the return of democratic politics, there has been public resistance to the bank’s policies throughout the continent:

“problems with implementation of the reform model have become apparent in many countries of the region. Due to a lack of political consensus, the general public’s increasingly negative view of privatizations and concessions, and private investors’ waning interest”.

The policy did nothing to extend coverage, and actively damaged the development of renewable energy. While the number of people without connections fell between 1990 and 2003:

“no cause-and-effect relationship can be ascribed to the incorporation of the reform model’s basic conditions and the increase in coverage. Implementation of the reform model could not be shown to have any beneficial effects in terms of environmental protection either. On the contrary, according to the literature, the proliferation of small thermal power plants has worked to the detriment of the expansion of renewable energy sources and has substantially raised carbon dioxide emissions.”

The policy also failed to improve either investment or efficiency:

“it has not met the objective of ensuring the long-term sustainability of services….As regards the objectives of achieving economic efficiency and safeguarding the quality of electricity services, the evidence compiled by OVE indicates that the situation in the region as a whole has not improved.” [[16]](#endnote-16)

Six years later, in 2013, the bank announced a review of the policy, but without any prospect of real change. It chose three people to offer their views at a consultative meeting: one was John Briscoe, the leading ideologist of utility privatisation at the World Bank during the 1990s and 2000s; the second was Gesner Oliveira, a former official of the right-wing Cardoso regime in Brazil, which attempted widespread privatisations, and is now a board member of an Israeli firm, Miya, which is aggressively seeking to gain privatised water business in the Philippines, Greece and elsewhere; and the third was Maximo Torero, a member of a mainstream research institute (IFPRI) whose projects suffer from the same problems as those of the IADB policy: they “have not produced anticipated benefits, despite being targeted at problems of great relevance to those countries… the lack of demonstrable impact within countries targeted by specific projects also gives rise to concerns regarding the ways in which projects have been designed and implemented.”[[17]](#endnote-17)

The IADB needs to scrap its utilities policy completely and replace it with a policy centred on supporting democratic decisions at country level, by providing loans to finance investment in infrastructure through public utilities.

## Development finance institutions and private equity funds

Donor countries and the development banks both channel an increasing proportion of their funds through divisions which invest directly in private companies: the World Bank’s IFC was the first example of this. Known as ‘Development Finance Institutions’ (DFIs) , they are responsible for about 25% of all aid spending. In 2012 European DFIs investments totalled €26 billion, about 10% of which was in energy.[[18]](#endnote-18)

The DFIs invest a high proportion of their money into private equity funds. They expect to get high profits from these investments, but private equity funds have bad reputations in terms of their treatment of labour and observation of environmental standards. Many private equity firms which invest in energy or other infrastructure in developing countries rely on the DFIs as major sources of finance, along with pension funds and sovereign wealth funds. [[19]](#endnote-19)

1. DFIs of donors

Source: EDFI Annual report <http://www.edfi.be/news/news/30-2012-annual-report.html>

|  |  |  |  |
| --- | --- | --- | --- |
| Country | Institution |  | Total investments €m. |
| Austria | OeEB | OeEB- The Development Bank of Austria | 500 |
| Belgium | SBI | SBI-BMI - Belgian Corporation for International Investment | 23 |
| Belgium | BIO | BIO - Belgian Investment Company for Developing Countries | 462 |
| Denmark | IFU/IØ | IFU/IØ - The Investment Fund for Developing Countries | 474 |
| Finland | FINNFUND | FINNFUND- Finnish Fund for Industrial Cooperation Ltd | 453 |
| France | PROPARCO | PROPARCO - Société de Promotion et de Participation pour la Coopération Economique | 4460 |
| Germany | DEG | DEG - Deutsche Investitions- und Entwicklungsgesellschaft mbH | 5958 |
| Italy | SIMEST | SIMEST- Società Italiana per le Imprese all'Estero | 849 |
| Netherlands | FMO | FMO- Netherlands Development Finance Company | 6280 |
| Norway | NORFUND | NORFUND - Norwegian Investment Fund for Developing Countries | 1134 |
| Portugal | SOFID | SOFID- Sociedade para o Financiamento do Desenvolvimento | 8 |
| Spain | COFIDES | COFIDES - Compañía Española de Financiación del Desarrollo | 700 |
| Sweden | SWEDFUND | SWEDFUND- Swedfund International AB | 311 |
| Switzerland | SIFEM | SIFEM - Swiss Investment Fund for Emerging Markets | 356 |
| UK | CDC | CDC – Capital for Development (formerly Commonwealth Development Corporation) | 4018 |
| UK + | PIDG | Private Infrastructure Development Group (PIDG); |  |
| USA | OPIC | Overseas Private Investment Corporation (OPIC) |  |

Source: EDFI Annual report <http://www.edfi.be/news/news/30-2012-annual-report.html>

1. DFI Investments 2009



Source: ODI 2011 <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67635/comparing-DFIs.pdf>

# Financing electricity in developing countries

## Needs and affordability

In 2010 1.3 billion people were without access to electricity, the great majority of whom are in sub-saharan Africa and South Asia, and in rural areas.

1. People without access to electricity, 2010

|  |  |  |  |
| --- | --- | --- | --- |
|  | Population without access to electricity | % of total population | Annual investment required for universal connection by 2030 |
| Sub-Saharan Africa | 589 | 68% | $23bn |
| Asia (developing) | 628 | 18% | $20bn |
| Latin America | 29 | 6% |  |
| Middle East | 18 | 9% |  |
| World (including high income) | 1267 | 19% |  |

Source: IEA [[20]](#endnote-20)

Nearly $1 trillion in cumulative investment is needed to achieve universal energy access by 2030, an average of $49billion per year, according to the IEA. [[21]](#endnote-21) This is a large figure, but it is quite affordable. It is equal to only 0.06% of global GDP – less than $7 per person per year. For developing countries themselves, it represents a higher proportion of their national income, but still quite affordable for many governments, even without aid (see below on Nigeria).

## Little private investment in system

### No private investment in extensions in Africa

Two major official reports published in 2010 make clear that private companies do not, and will not, provide any significant proportion of investment in electricity in Africa. A World Bank study of investment in electricity and other infrastructure in sub-Saharan Africa shows that private companies have provided only about 10% of total investment in the sector – and nearly all of that is in IPPs, not in extensions to the system. The majority of investment comes from public finance, followed by aid from donor countries and development banks. [[22]](#endnote-22) An IEA report goes further, arguing that “in most developing countries upfront public investment in developing national and local capacity is the most important ingredient” for attracting any private investment at all – and even then it will only take place “where a commercial return can be reliably earned on the investment”. [[23]](#endnote-23) These confirm the results of previous World bank reports in 2005 and 2006 reports which found that only 10% of Africa’s investment needs for infrastructure have been financed by the private sector, and neither private sector participation nor regulation makes any significant contribution to the extension of access to network services. [[24]](#endnote-24)

1. 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>

Extending systems requires the use not only of public finance but also of social policies. The World Bank report says about half of the non-electrified urban population consists of extremely poor people living in slums with insecure legal tenure. Delivering connections thus requires government action, with social policies to subsidise high connection charges. Private companies will not risk expanding into such areas however because they would face “power theft” through illegal connections by the poor.

Low coverage in cities also affects the prospects for the rural poor: the World Bank study points out that “Countries with seriously underdeveloped generation capacity and tiny urban customer bases are not well placed to tackle rural electrification…. because of the lack of a basis for cross-subsidization.” In such countries government tax revenues are even more crucial for financing extensions. Privatisation makes either approach much more difficult. [[25]](#endnote-25)

The report also says that experience shows that a centralised public sector utility delivers much better results in rural electrification than fragmented or privatised approaches:

“countries that have taken a centralized approach to electrification, with the national utility responsible for extending the grid, have been more successful than those that followed decentralized approaches, where a rural electrification agency attempted to recruit multiple utilities or private companies into the electrification campaign.” [[26]](#endnote-26)

### Other problems and limits of private investment

Most of the private sector investment relates to investment in generation, through independent power producers (IPPs). These have been encouraged by the World Bank, donors and many others since the early 1990s. But after 20 years they still make very little contribution to the power generation needs of Africa: a comprehensive report in September 2010 of IPPs in Africa states that they “represent a small fraction of total generation capacity and have mostly complemented incumbent state-owned utilities.”[[27]](#endnote-27) The World Bank study also describes them as “relatively costly because of technology choices, procurement problems, and currency devaluations”.[[28]](#endnote-28) IPPs use gas generation, which is not as cheap or clean as hydro plants, for example: “This is why in countries like Ghana tariffs increased steeply after the introduction of thermal generation with IPPs.” (Dagdeviren 2009) [[29]](#endnote-29)

IPPs depend on long-term power purchase agreements (PPAs), lasting for 20-30 years, under which the government or a state agency guarantees to buy the output at an agreed price. The profits obviously depend on the price levels written into the contract, so there is a huge incentive for corruption. There have been many examples of corrupt and overpriced IPPs in African countries, including Kenya, Uganda and Tanzania, as well as the scandal of the Enron/AES power barges in Nigeria itself, and in many other countries including Pakistan and Indonesia. [[30]](#endnote-30)

In Chile: “Transmission facility failures and coordination problems have led to supply disruptions that have reached notorious levels. The disruptions, with a population accustomed to thinking of electricity as an infallible service, have led to unrest. The environmental and social sustainability of the Chilean model of electrical development has also been questioned and frequently results in public demonstrations, political arguments, and judicial confrontations. ….All this has been accompanied by what is probably the most sensitive issue, for both the population and most productive sectors: a substantial increase in electricity prices” *[[31]](#endnote-31)*

In Vietnam: To enable private companies to operate in the sector, large amounts of public money are invested in sectoral reforms, including unbundling public utilities, privatisation, the creation of wholesale and retail markets, changes in pricing policy. …..77% of all World Bank loans to the energy sector (USD $2.181 billion) have been to support sector ‘reform’, rather than investment in generating capacity or extension of the system. The latest loan, Power Sector Reform DPO2, worth $200 million, supports ‘electricity tariff reform, …..development of a competitive power market and subsidy reduction’ . Yet the system created by these loans does not even lead to competitive markets: the government and the public utility, EVN, have signed dollar-pegged 20 year power purchase agreements (PPAs) with Electricité de France (EDF), Sumitomo and the Tokyo Electric Power Company, under which EVN is forced to buy in any amount produced at the regularly exchange-rate-adjusted price.

## Successful extension of electricity connections through public finance

A number of developing countries have already shown that it is possible to provide rapid electrification – in all cases, through using public finance, with no contribution from private investment.

### Brazil: Luz Para Todos (“Light for All”)

Launched in 2003, the Luz Para Todos programme aims to achieve universal access to electricity in Brazil by 2014. It had provided access to an additional 14.5 million people by late 2011, and Brazil can now boast an electrification rate of almost 99%. The programme provides an electricity connection free of charge, together with three lamps and the installation of two outlets in each home. Tariffs are regulated at a “social” rate, with a 65% discount for monthly consumption below 30 kWh, a 40% discount from 31-100 kWh, 10% discount from 101-220 kWh and no discount above this level. The programme is paid for through public finance from the Ministry of Mines and Energy, co-ordinated by Electrobrás (the holding company of the Brazilian electricity sector) and executed by the utilities and rural electrification co-operatives. (Niez, 2010). [[32]](#endnote-32)

### Vietnam

Vietnam increased access to electricity from 15% to 95% in just 15 years, using public finance. The programme was delivered through “the leadership of a strong state utility (EVN) and an effective partnership between it and local utilities” as well as “sustaining strong public and political support for efforts to improve electrification” (World Bank, 2010b; Asian Development Bank, 2011).

### South Africa

South Africa massively increased the number of households connected to its electricity system, after the end of the apartheid regime in 1994. The percentage of the population with access to electricity rose from 40 percent in 1994 to 66 percent in 2002: 79 percent of the population in urban areas and 46 percent in rural areas had access to electricity. By the end of 2006 over 3.3 million households had been connected. This was financed first by cross-subsidies, through a surcharge on other electricity users, and then from tax revenues: the continuing programme is financed from a national government fund. One effect of rural electrification was a significant increase in employment of women in rural areas South Africa also provides subsidies to enable poor households to receive 50 KWh per month free, with reduced tariffs after that point. By the end of 2006, 1 million households were benefiting from this. [[33]](#endnote-33)

### Nigeria: universal access possible in 10 years using 0.6% of oil revenues

A similar approach is possible and affordable for other countries. After India and Bangladesh, Nigeria has the third largest population in the world without access to electricity, a total of about 79 million people – half the population. The Nigerian government has embarked on breaking up and privatising the public utility, claiming that only private companies can afford this kind of investment, despite all the evidence that private companies do not invest in access.

However, the total cost of providing the networks, connections and power stations necessary for universal access to electricity – for all households in Nigeria – is $6 billion, according to the IEA. And Nigeria can easily afford to carry out this investment in just 10 years, using public finance: $6 billion represents only 0.6% of Nigeria’s oil revenues. As an IEA economist, Fatih Birol, stated in September 2010, if Nigeria spent just a small fraction: “of its oil and gas revenues on energy power and electricity, they would solve this problem immediately…. If left to the markets they will never get access to electricity." [[34]](#endnote-34)

**Nigeria could connect its entire population within a decade, if it keeps the system in public hands, and invests.**

Affordability of universal electricity access for Nigeria

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | $billion | Investment required as % of revenues from oil and gas royalties each year  |
| Total investment required for universal electricity access |  | 6 |  |
| Oil revenues 2010-2020  | 10 years | 1020 | 0.6% |

Source: WEO 2008: Chapter 15 “Prospects in oil- and gas- exporting sub-Saharan African countries” table 15.6, figure 15.6 <http://www.iea.org/weo/database_electricity/WEO2008-Chapter%2015.pdf>; and PSIRU calculations[[35]](#endnote-35)

# Annexe:

## IMF loans as of June 2013

Source: <http://www.imf.org/external/np/fin/tad/extarr11.aspx?memberKey1=ZZZZ&date1key=2013-06-30>

|  |
| --- |
| Lending arrangements, which are similar to a line of credit, are approved by the IMF Executive Board to support a country's adjustment program. The arrangement requires the member to observe specific terms in order to be eligible to receive a disbursement. The IMF lends under Stand-by, Extended, Flexible Credit Line and Precautionary and Liquidity Line arrangements, and at reduced rates, under Poverty Reduction and Growth Trust and Exogenous Shocks Facility arrangements. |

(In Thousands of SDRs = USDollars)

|  |
| --- |
| **General Resources Account (GRA)** |
|  |
| **Stand-By Arrangements (SBA)** |
| **Member**  | **Date ofArrangement** | **Expiration** | **Total AmountAgreed** | **UndrawnBalance** | **IMF CreditOutstandingUnder GRA** |
| [Bosnia and Herzegovina](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=75&date1key=2013-06-30) | September 26, 2012 | September 25, 2014 | 338,200 | 169,100 | 423,595 |
| [Georgia](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=335&date1key=2013-06-30) | April 11, 2012 | April 10, 2014 | 125,000 | 125,000 | 303,188 |
| [Jordan](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=530&date1key=2013-06-30) | August 03, 2012 | August 02, 2015 | 1,364,000 | 852,500 | 511,500 |
| [Kosovo](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=555&date1key=2013-06-30) | April 27, 2012 | December 26, 2013 | 90,968 | 12,752 | 96,976 |
| [St. Kitts and Nevis](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=821&date1key=2013-06-30) | July 27, 2011 | July 26, 2014 | 52,510 | 9,407 | 44,216 |
| [Tunisia](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=970&date1key=2013-06-30) | June 07, 2013 | June 06, 2015 | 1,146,000 | 1,047,200 | 98,800 |
| **Total** | **3,116,678** | **2,215,959** | **1,478,274** |
|  |
| **Extended Arrangements (EFF)** |
| **Member**  | **Date ofArrangement** | **Expiration** | **Total AmountAgreed** | **UndrawnBalance** | **IMF CreditOutstandingUnder GRA** |
| [Cyprus](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=230&date1key=2013-06-30) | May 15, 2013 | May 14, 2016 | 891,000 | 816,750 | 74,250 |
| [Greece](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=360&date1key=2013-06-30) | March 15, 2012 | March 14, 2016 | 23,785,300 | 18,081,200 | 23,245,900 |
| [Ireland](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=470&date1key=2013-06-30) | December 16, 2010 | December 15, 2013 | 19,465,800 | 1,260,375 | 18,205,425 |
| [Jamaica](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=510&date1key=2013-06-30) | May 01, 2013 | April 30, 2017 | 615,380 | 478,630 | 626,763 |
| [Portugal](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=810&date1key=2013-06-30) | May 20, 2011 | May 19, 2014 | 23,742,000 | 4,042,000 | 19,700,000 |
| [Seychelles](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=843&date1key=2013-06-30) | December 23, 2009 | December 22, 2013 | 26,400 | 3,300 | 27,940 |
| **Total** | **68,525,880** | **24,682,255** | **61,880,278** |
|  |
| **Flexible Credit Line (FCL)** |
| **Member**  | **Date ofArrangement** | **Expiration** | **Total AmountAgreed** | **UndrawnBalance** | **IMF CreditOutstandingUnder GRA** |
| [Colombia](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=190&date1key=2013-06-30) | June 24, 2013 | June 23, 2015 | 3,870,000 | 3,870,000 | 0 |
| [Mexico](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=670&date1key=2013-06-30) | November 30, 2012 | November 29, 2014 | 47,292,000 | 47,292,000 | 0 |
| [Poland, Republic of](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=805&date1key=2013-06-30) | January 18, 2013 | January 17, 2015 | 22,000,000 | 22,000,000 | 0 |
| **Total** | **73,162,000** | **73,162,000** | **0** |
|  |
| **Precautionary and Liquidity Line (PLL) 1/** |
| **Member**  | **Date ofArrangement** | **Expiration** | **Total AmountAgreed** | **UndrawnBalance** | **IMF CreditOutstandingUnder GRA** |
| [Morocco](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=680&date1key=2013-06-30) | August 03, 2012 | August 02, 2014 | 4,117,400 | 4,117,400 | 0 |
| **Total** | **4,117,400** | **4,117,400** | **0** |
|  |
| **Poverty Reduction and Growth Trust (PRGT)** |
|  |
| **Extended Credit Facility (ECF) 2/** |
| **Member**  | **Date ofArrangement** | **Expiration** | **Total AmountAgreed** | **UndrawnBalance** | **IMF CreditOutstandingUnder PRGFT** |
| [Afghanistan, Islamic Republic of](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=10&date1key=2013-06-30) | November 14, 2011 | November 13, 2014 | 85,000 | 61,000 | 93,320 |
| [Armenia, Republic of](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=35&date1key=2013-06-30) | June 28, 2010 | September 27, 2013 | 133,400 | 26,600 | 129,922 |
| [Bangladesh](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=55&date1key=2013-06-30) | April 11, 2012 | April 10, 2015 | 639,960 | 365,691 | 396,596 |
| [Benin](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=65&date1key=2013-06-30) | June 14, 2010 | September 13, 2013 | 74,280 | 21,220 | 76,950 |
| [Burkina Faso](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=95&date1key=2013-06-30) | June 14, 2010 | July 31, 2013 | 82,274 | 6,450 | 136,038 |
| [Burundi](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=110&date1key=2013-06-30) | January 27, 2012 | January 26, 2015 | 30,000 | 20,000 | 90,096 |
| [Central African Republic](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=140&date1key=2013-06-30) | June 25, 2012 | June 24, 2015 | 41,775 | 34,812 | 65,331 |
| [Comoros](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=195&date1key=2013-06-30) | September 21, 2009 | December 31, 2013 | 13,573 | 1,558 | 11,272 |
| [Cote d'Ivoire](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=225&date1key=2013-06-30) | November 04, 2011 | November 03, 2014 | 390,240 | 130,080 | 561,057 |
| [Gambia, The](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=330&date1key=2013-06-30) | May 25, 2012 | May 24, 2015 | 18,660 | 7,775 | 32,833 |
| [Guinea](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=380&date1key=2013-06-30) | February 24, 2012 | February 23, 2015 | 128,520 | 73,440 | 55,585 |
| [Haiti](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=400&date1key=2013-06-30) | July 21, 2010 | July 20, 2013 | 40,950 | 4,914 | 36,036 |
| [Kenya](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=540&date1key=2013-06-30) | January 31, 2011 | January 30, 2014 | 488,520 | 71,921 | 638,549 |
| [Kyrgyz Republic](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=565&date1key=2013-06-30) | June 20, 2011 | June 19, 2014 | 66,600 | 19,030 | 127,729 |
| [Lesotho](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=590&date1key=2013-06-30) | June 02, 2010 | September 30, 2013 | 50,605 | 5,680 | 46,675 |
| [Liberia](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=600&date1key=2013-06-30) | November 19, 2012 | November 18, 2015 | 51,680 | 44,298 | 49,520 |
| [Malawi](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=630&date1key=2013-06-30) | July 23, 2012 | July 22, 2015 | 104,100 | 65,050 | 128,717 |
| [Niger](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=730&date1key=2013-06-30) | March 16, 2012 | March 15, 2015 | 78,960 | 56,400 | 52,264 |
| [Sao Tome & Principe](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=827&date1key=2013-06-30) | July 20, 2012 | July 19, 2015 | 2,590 | 1,850 | 3,806 |
| [Solomon Islands](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=865&date1key=2013-06-30) | December 07, 2012 | December 06, 2015 | 1,040 | 891 | 12,629 |
| **Total** | **2,522,727** | **1,018,660** | **2,744,924** |
|  |
| **Standby Credit Facility (SCF)** |
| **Member**  | **Date ofArrangement** | **Expiration** | **Total AmountAgreed** | **UndrawnBalance** | **IMF CreditOutstandingUnder PRGFT** |
| [Georgia](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=335&date1key=2013-06-30) | April 11, 2012 | April 10, 2014 | 125,000 | 125,000 | 57,400 |
| [Tanzania](http://www.imf.org/external/np/fin/tad/extarr2.aspx?memberKey1=930&date1key=2013-06-30) | July 06, 2012 | January 05, 2014 | 149,175 | 74,575 | 299,830 |
| **Total** | **274,175** | **199,575** | **357,230** |

|  |
| --- |
| 1/ Formerly Precautionary Credit Line (PCL).2/ Formerly Poverty Reduction and Growth Facility (PRGF). |

## World Bank loans in energy in energy >$500m. August 2013

More details on all these projects, and on other smaller WB energy projects, in all countries, can be found by accessing the World Bank site at <http://www.worldbank.org/projects> , or by following the url links to the specific projects in the table below

1. World Bank loans sector projects over $500m., active and pipeline, August 2013

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **COUNTRY** | **PROJECT NAME** | **PROJECT ID** | **TOTAL PROJECT COST $M.** | **WB LOAN $M.** |
| Africa | The Eastern Electricity Highway Project under the First Phase of the Eastern Africa Power Integration Program | P126579 | 1263 | 684 |
| Africa | Regional and Domestic Power Markets Development Project (Southern Africa Power Market Project: APL-1b) | P097201 | 501 | 297 |
| Africa | First Part of the Second Phase of the Niger Basin Water Resources Development and Sustainable Ecosystems Management Program - APL 2A | P130174 | 785 | 203 |
| Africa | Regional Transmission Development APL | P108934 | 500 | 150 |
| Africa | 3A-West African Gas Pipeline (IDA S/UP) | P082502 | 590 | 50 |
| Botswana | Botswana - Morupule B Generation and Transmission Project | P112516 | 1662 | 136 |
| Kenya | Electricity Expansion | P103037 | 1391 | 330 |
| Kenya | Electricity Modernization Project | P120014 | 500 | 200 |
| Mozambique | MZ-Southern Africa Regional Gas Project | P082308 | 721 | 30 |
| Nigeria | Nigeria Power Sector Guarantees Project | P120207 | 800 | 800 |
| South Africa | Eskom Investment Support Project | P116410 | 10750 | 3750 |
| South Africa | South Africa - Eskom Renewables Support Project | P122329 | 1228 | 0 |
| Uganda | UG - Private Power Generation (Bujagali) Project | P089659 | 798 | 115 |
| China | Wenchuan Earthquake Recovery | P114107 | 740 | 710 |
| China | China Energy Efficiency Financing | P084874 | 571 | 200 |
| China | Jiangxi Wuxikou Integrated Flood Management Project | P128867 | 514 | 100 |
| Indonesia | Upper Cisokan Pumped Storage Hydro-Electrical Power (1040 MW) Project | P112158 | 800 | 640 |
| Indonesia | National Community Empowerment Program In Urban Areas For 2012-2015 | P125405 | 500 | 266 |
| Indonesia | Geothermal Clean Energy Investment Project | P113078 | 575 | 175 |
| Laos | Lao Nam Theun 2 Power Project (former was under PE-P004206-LEN) | P076445 | 1450 | 42 |
| Vietnam | Distribution Efficiency Project | P125996 | 800 | 449 |
| Kosovo | Kosovo Power Project | P118287 | 2000 | 50 |
| Romania | Development Policy Operation - DDO | P130051 | 1333 | 1333 |
| Russian Federation | Russia Energy Efficiency Financing Project | P122492 | 775 | 300 |
| Turkey | Private Sector Renewable Energy and Energy Efficiency Project | P112578 | 1150 | 500 |
| Turkey | Private Sector Renewable Energy and Energy Efficiency Additional Financing | P124898 | 650 | 500 |
| Turkey | GAS SECTOR DEVELOPMENT | P093765 | 538 | 325 |
| Turkey | Gas Sector Development Additional Financing | P133565 | 614 | 225 |
| Brazil | ELETROBRAS Distribution Rehabilitation | P114204 | 709 | 495 |
| Brazil | GUARANTEED NOTE TRANSPORTADORA BRASILEIRA GASODUTO BOLIVIA-BRASIL S.A. | P055924 | 2032 | 180 |
| Egypt | EG-Ain Sokhna Power Project | P100047 | 2190 | 600 |
| Egypt | EG-Giza North Power Project | P116194 | 1412 | 600 |
| Egypt | EG - Helwan South Power Project | P117407 | 2404 | 585 |
| Egypt | EG-Giza North Additional Financing | P116198 | 764 | 240 |
| Egypt | Kom Ombo Solar Power | P120191 | 525 | 170 |
| Egypt | Egypt - Wind Power Development Project | P113416 | 796 | 70 |
| Morocco | MA-Ouarzazate Concentrated Solar Power | P122028 | 1438 | 200 |
| Morocco | Jorf Lasfar Power Project | P045615 | 1600 | 0 |
| Bangladesh | Bangladesh: Rural Electricity Transmission and Distribution Project | P129920 | 680 | 580 |
| India | Financing Public Private Partnerships (PPPs) in Infrastructure through Support to the India Infrastructure Finance Company Ltd | P102771 | 1195 | 1195 |
| India | Fifth Power System Development Project | P115566 | 1572 | 1000 |
| India | Luhri Hydro Electric Project | P102843 | 1150 | 650 |
| India | Vishnugad Pipalkoti Hydro Electric Project | P096124 | 922 | 648 |
| India | POWER SYSTEM DEVELOPMENT PROJECT IV | P101653 | 2114 | 600 |
| India | North Eastern Region Power System Improvement Project | P127974 | 530 | 425 |
| India | Power System Development IV - Additional Financing | P112798 | 2114 | 400 |
| India | Rampur Hydropower Project | P095114 | 670 | 400 |
| Pakistan | Tarbela Fourth Extension Hydropower Project | P115893 | 914 | 840 |
| Pakistan | PK: Hub Power Guarantee | P069043 | 1500 | 240 |
| Pakistan | Uch Power Project | P040547 | 690 | 0 |

## ADB loans in energy sector

See <http://www.adb.org/projects>

1. ADB projects in energy sector >$200m. current or proposed August 2013

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Country | Project Name | ADB loan ($million) | Approval Date | Project Number |
| Viet Nam | Multitranche Financing Facility Mong Duong 1Thermal Power Project | 930.71 | 21/09/2007 | 39595-013 |
| Viet Nam | Mong Duong 1Thermal Power Project - Tranche 2 | 902.85 | 21/12/2009 | 39595-033 |
| Pakistan | MFF - Power Distribution Enhancement Investment Program | 810 | 03/09/2008 | 38456-013 |
| India | MFF - Himachal Pradesh Clean Energy Development Investment Program (Facility Concept) | 800 | 23/10/2008 | 41627-013 |
| Pakistan | MFF - Power Transmission Enhancement | 800 | 12/12/2006 | 37192-013 |
| Pakistan | Energy Efficiency Investment Program | 780 | 17/09/2009 | 42051-013 |
| India | MFF - Madhya Pradesh Power Sector Investment Program (Facility Concept) | 620 | 29/03/2007 | 32298-013 |
| India | MFF - National Power Grid Development Investment Program (Facility Concept) | 600 | 28/03/2008 | 39630-013 |
| Pakistan | MFF - Renewable Energy Development Sector Investment Program (formerly Renewable Energy Development Facility) | 510.8 | 01/12/2006 | 34339-013 |
| India | National Grid Improvement Project | 500 | 30/09/2011 | 44426-014 |
| India | MFF-Clean Energy Finance Investment Program (Facility Concept) | 500 |  | 46268-001 |
| Bangladesh | Sustainable Power Sector Development Program (Project) | 405 | 26/06/2007 | 36107-013 |
| India | Madhya Pradesh Energy Efficiency Improvement Investment Program (Facility Concept) | 401 | 07/07/2011 | 43467-014 |
| India | MFF - National Power Grid Development Investment Program (Tranche1) | 400 | 28/03/2008 | 39630-023 |
| India | Power Grid Transmission (Sector) Project | 400 | 21/12/2004 | 38492-013 |
| Viet Nam | Northern Power Transmission Expansion (Sector) Project | 360 |  | 38196-013 |
| India | MFF - Himachal Pradesh Clean Energy Transmission Investment Program (Facility Concept) | 350.6 | 30/09/2011 | 43464-013 |
| India | Madhya Pradesh Power Transmission and Distribution System Improvement Project | 350 |  | 47100-004 |
| Uzbekistan | Talimarjan Power Project (formerly CASAREM-Talimarjan Energy Development Project) | 350 | 20/04/2010 | 43151-023 |
| India | Himachal Pradesh Clean Energy Development Investment Program - Tranche 4 | 315 | 02/10/2012 | 41627-053 |
| Bangladesh | MFF-Power System Expansion and Efficiency Improvement Investment Program (Tranche 2) | 310 |  | 42378-016 |
| Viet Nam | O Mon IV Combined Cycle Power Plant Project | 309.89 | 24/11/2011 | 43400-013 |
| India | MFF - Uttaranchal Power Sector Investment Program (Facility Concept) | 300 | 30/03/2006 | 37139-013 |
| India | Assam Power Sector Investment Program | 300 |  | 47101-001 |
| Pakistan | Power Distribution Enhancement Investment Program - Tranche 3 | 245 | 14/12/2012 | 38456-034 |
| Pakistan | Power Transmission Enhancement Investment Program - Tranche 3 | 243.24 | 22/12/2011 | 37192-043 |
| Pakistan | Power Distribution Enhancement Investment Program - Tranche 2 | 242 | 14/12/2010 | 38456-033 |
| Azerbaijan | Janub Gas-Fired Power Plant Project | 232.32 | 22/06/2010 | 43406-013 |
| Bangladesh | Gas Transmission and Development Project | 230 | 27/10/2005 | 35242-013 |
| Indonesia | Java-Bali 500 KV Power Transmission Crossing | 224 |  | 42362-013 |
| Pakistan | MFF-Power Transmission Enhancement Investment Program PFR2 | 220 | 17/12/2007 | 37192-033 |
| Pakistan | Power Distribution Enhancement Investment Program- Project 1 | 210.826 | 12/09/2008 | 38456-023 |
| Afghanistan | Energy Sector Development Investment Program - Tranche 4 | 200 | 18/12/2012 | 42094-052 |
| India | Madhya Pradesh Energy Efficiency Improvement Investment Program - Tranche 2 | 200 | 14/12/2011 | 43467-016 |
| India | Madhya Pradesh Energy Efficiency Improvement Investment Program - Tranche 1 | 200 | 15/07/2011 | 43467-015 |
| Pakistan | Renewable Energy Development Sector Investment Program - Tranche 2 | 200 | 13/12/2010 | 34339-033 |

## IADB loans related to electricity, in pipeline 2013 and started since 2010

Source: [http://www.iadb.org/en/projects/projects,1229.html](http://www.iadb.org/en/projects/projects%2C1229.html)

These tables identify all IADB loans related to electricity which are either in preparation as at August 2013, or started since July 2010.

1. IADB – electricity-related projects in pipeline August 2013

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| COUNTRY | NAME | PROJECT NUMBER | IDB FINANCE $m.  | APPROVAL DATE |
| Argentina | Energy Topics - Southern Wind Project | AR-L1123 | 60.00 | Preparation |
| Dominican Republic | Support for the distribution network improvement and electricity losses reductio | DR-L1034 | 78.00 | Preparation |
| Ecuador | CondorSolar Solar Connection Project | EC-L1126 | 60.00 | Preparation |
| Ecuador | Electrification Program for Rural and Marginal Urban Areas- II | EC-L1128 | 30.00 | Preparation |
| Haiti | Rehabilitation of the Peligre Transmission Line | HA-G1030 | 8.00 | Preparation |
| Honduras | Support for the Integration of Honduras in the Regional Electricity Market | HO-L1039 | 22.50 | Preparation |
| Nicaragua | Program to Strengthen the Energy Sector in Nicaragua | NI-L1074 | 22.50 | Preparation |
| Suriname | Support to Improve Sustainability and Accessibility of the Electricity Service | SU-L1009 | 25.00 | Preparation  |

1. IADB – electricity-related projects started since July 2010

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| COUNTRY | NAME | PROJECT NUMBER | IDB FINANCE $m. | APPROVAL DATE |
| Argentina | Supply Elec. to Country's Regions under Federal Electricity Transmission Plan | AR-L1079 | 120.00 | Jan 11, 2011 |
| Bolivia | Cochabamba - La Paz Transmission Line | BO-L1072 | 78.00 | Nov 30, 2011 |
| Bolivia | Rural Electrification Program | BO-L1050 | 60.00 | Nov 17, 2010 |
| Bolivia | Promotion, Support & Development of Sustainable Energy in Bolivia | BO-T1179 | 0.50 | Nov 26, 2012 |
| Bolivia | Development of Lithium in Bolivia | BO-T1132 | 0.30 | Sep 14, 2010 |
| Bolivia | Support to Cochabamba-La Paz Transmission Line | BO-T1150 | 0.19 | Jun 30, 2011 |
| Bolivia | Inclusion, Development and Municipal Management | BO-T1133 | 0.15 | Aug 27, 2010 |
| Brazil | Pro-Energy RS Distribution | BR-L1284 | 130.56 | Feb 15, 2012 |
| Brazil | Rehabilitation for the Furnas and Luiz Carlos Barreto Hydroelectric Power Plant | BR-L1278 | 128.66 | Jul 25, 2011 |
| Brazil | Development Program for the Southwest Region of the State of Tocantins | BR-L1152 | 99.00 | Nov 3, 2010 |
| Brazil | CEEE Generation and Transmission Project | BR-L1303 | 88.66 | Nov 1, 2012 |
| Brazil | PROCIDADES - Economic Development Program of Distrito Federal-ADEs | BR-L1076 | 50.00 | Jun 27, 2013 |
| Brazil | Support to the Organizational Restructuring of FURNAS | BR-T1216 | 0.50 | Apr 24, 2012 |
| Brazil | Portable Light Project Brazil | BR-T1198 | 0.26 | Mar 3, 2011 |
| Chile | Promotion and Development of Local Solar Technologies in Chile | CH-X1007 | 2.73 | Nov 1, 2012 |
| Chile | Support to Energy Efficiency in Residential and Municipal Sector | CH-T1128 | 0.17 | Sep 17, 2012 |
| Colombia | Support for Structuring the Ituango Hydroelectric Project | CO-T1250 | 1.50 | Jul 30, 2012 |
| Costa Rica | Power Sector Development Program 2012-2016 (Reventazón Hydroelectric Project) | CR-L1049 | 250.00 | Jun 25, 2012 |
| Costa Rica | Studies and Support Environmental and Social Strategy PH Reventazón | CR-T1086 | 0.74 | Dec 4, 2012 |
| Costa Rica | Reventazón Hydroelectric Project Complementary Environmental Studies | CR-T1074 | 0.47 | May 12, 2011 |
| Dominican Republic | Power Sector Sustainability and Efficiency Program | DR-L1050 | 200.00 | Nov 2, 2011 |
| Dominican Republic | Support to the Design and Execution of the Power Sector Sustainability Program | DR-T1086 | 0.31 | Dec 13, 2012 |
| Ecuador | Support for the Transmission Program | EC-L1070 | 64.70 | Nov 17, 2010 |
| Ecuador | Electrification Program for rural and marginal urban areas of Ecuador | EC-L1087 | 40.00 | Nov 2, 2011 |
| Ecuador | Sustainable Off-grid Renewable Energy Solutions for Remote Communities | EC-M1063 | 1.00 | Aug 1, 2013 |
| Ecuador | Rural Electrification with Renewable Energies in Isolated Areas of Ecuador | EC-G1001 | 0.91 | Apr 17, 2013 |
| Ecuador | Measuring Impacts of Rural Electrification projects in Ecuador | EC-T1259 | 0.40 | Nov 20, 2012 |
| Ecuador | Support to the National Hidroelectric Expansion Program | EC-T1221 | 0.22 | Jun 23, 2011 |
| Ecuador | Support to EC-L1087 Program ( Ecuadorian Rural/Marginal Electrification Program) | EC-T1222 | 0.20 | Apr 13, 2011 |
| Ecuador | Support to Rural Electrification Program in Ecuador | EC-T1235 | 0.18 | Dec 12, 2011 |
| Guyana | Sustainable Operation of the Electricity Sector and Improved Quality of Service | GY-L1037 | 5.00 | Sep 7, 2011 |
| Haiti | Program for Rehabilitation of Basic Economic Infrastructure | HA0093 | 70.00 | Sep 29, 2010 |
| Haiti | Supplementary Financing for the Peligre Hydroelectric Plant | HA-L1038 | 20.00 | Dec 14, 2011 |
| Haiti | Rehabilitation of Electricity Distribution System in Port au Prince | HA-L1014 | 18.09 | Sep 29, 2010 |
| Haiti | Artibonite 4C Hydroelectric Project - Studies | HA-T1150 | 1.50 | May 22, 2012 |
| Haiti | Towards a Sustainable Energy Sector Haiti - White Paper | HA-T1130 | 0.10 | Jul 26, 2010 |
| Honduras | Feasibility Studies Patuca III Project | HO-T1158 | 0.90 | Jun 24, 2011 |
| Mexico | Assessment of Geothermal Potential in Mexico | ME-T1161 | 0.06 | Nov 4, 2010 |
| Nicaragua | National Sustainable Electrification and Renewable Energy Program III | NI-L1063 | 35.00 | Nov 1, 2012 |
| Nicaragua | National Sustainable Electrification and Renewable Energy Program (PNESER) II | NI-L1050 | 22.00 | Jul 25, 2011 |
| Nicaragua | San Jacinto-Tizate Community Water Rehabilitation Project | NI-G1004 | 0.33 | Nov 1, 2012 |
| Panama | Strengthening of Energy Efficiency at the IDAAN | PN-T1093 | 0.30 | Oct 1, 2012 |
| Panama | Strengthening of Energy Efficiency at the IDAAN | PN-T1101 | 0.30 | Oct 1, 2012 |
| Paraguay | Support Conceptualization and Development of Industrial Park and Aluminum Plant | PR-T1117 | 0.27 | Dec 12, 2011 |
| Regional | Pre-Feasibility Study for the "Arco Norte" Interconnection Project | RG-T2257 | 1.90 | May 29, 2013 |
| Regional | Regional Electricity Market Consolidation in CA. Second Stage | RG-T1736 | 1.50 | Sep 20, 2010 |
| Regional | Sustainable Energy for All | RG-T1881 | 0.60 | Sep 12, 2011 |
| Regional | Sustainable Energy Rating For Latin-America And The Caribbean | RG-T2201 | 0.45 | Jun 26, 2013 |
| Regional | Sustainable Energy Rating for Latin-America and the Caribbean | RG-T2327 | 0.45 | Jun 26, 2013 |
| Regional | Support for the Mesoamerican Biofuels Research and Development Network | RG-T1966 | 0.35 | Dec 8, 2011 |
| Regional | Smart Grid and Its Application in Sustainable Cities | RG-T2058 | 0.25 | Mar 7, 2012 |
| Regional | Evaluation of Strategic Photovoltaic Solar Energy Applications in Developing Cou | RG-T1880 | 0.09 | Dec 13, 2010 |
| Suriname | Support to the Institutional and Operational Strengthening of the Energy Sector | SU-L1022 | 15.00 | Nov 20, 2012 |
| Suriname | Development of Renewable Energy, Energy Efficiency and Electrification | SU-G1001 | 4.40 | Apr 11, 2013 |
| Suriname | Support for the Preparation of the Sustainable Energy Framework | SU-T1055 | 0.70 | Oct 2, 2012 |
| Uruguay | Punta del Tigre Combined Cycle Power Generation Project | UR-L1070 | 200.00 | Dec 17, 2012 |
| Uruguay | Montes del Plata | UR-L1068 | 200.00 | Aug 2, 2011 |
| Uruguay | El Libertador Wind Project | UR-L1077 | 66.00 | Dec 5, 2012 |
| Venezuela | Rehabilitation of Units 1 to 6 of Powerhouse I Simón Bolivar Hydroelectric Plant | VE-L1033 | 700.00 | Oct 27, 2010 |
| Venezuela | Support to the Comprehensive Institutional Development of CORPOELEC Program | VE-T1020 | 0.30 | Feb 16, 2011 |

# Notes

1. <http://www.imf.org/external/np/loi/2013/tun/052413.pdf> [↑](#endnote-ref-1)
2. Lin, Boqiang, and Zhujun Jiang. 2011. ‘Estimates of Energy Subsidies in China and Impact of Energy Subsidy Reform’. *Energy Economics* 33 (2) (March): 273–283. doi:10.1016/j.eneco.2010.07.005. <http://www.sciencedirect.com/science/article/pii/S0140988310001143> [↑](#endnote-ref-2)
3. ‘Declaración Del MORENO: El Sistema Eléctrico Argentino’. 2013. Accessed August 27. <http://www.fetera.org.ar/index.php/politica-energetica/245-declaracion-del-moreno-el-sistema-electrico-argentino> [↑](#endnote-ref-3)
4. Reuters March 22, 2013 Eskom Criticised For Selling Power To BHP Billiton At Cheaper Prices <http://www.ventures-africa.com/2013/03/eskom-criticised-for-selling-power-to-bhp-billiton-at-cheaper-prices/> ; Birnbauer, William; Dowling, Jason (2006-05-21). ["The Age - 'Greenhouse showdown over smelter' - May 21, 2006"](http://www.theage.com.au/articles/2006/05/20/1147545567966.html). [↑](#endnote-ref-4)
5. World Bank Project: Turkey - Private Sector Renewable Energy and Energy Efficiency 2009and additional financing of $650 million: <http://www.worldbank.org/projects/P124898/private-sector-renewable-energy-energy-efficiency-additional-financing?lang=en&tab=overview> ; and .<http://www.worldbank.org/projects/P112578/private-sector-renewable-energy-energy-efficiency-project?lang=en&tab=overview> [↑](#endnote-ref-5)
6. WB project – India - Financing Public Private Partnerships (PPPs) in Infrastructure <http://www.worldbank.org/projects/P102771/financing-public-private-partnerships-ppps-infrastructure-through-support-india-infrastructure-finance-company-ltd?lang=en&tab=overview> [↑](#endnote-ref-6)
7. WAPP APL2 Felou Hydroelectric Project <http://www.worldbank.org/projects/P094916/wapp-apl-2-omvs-felou-hydroelectric-project?lang=en&tab=overview> [↑](#endnote-ref-7)
8. <http://www.brettonwoodsproject.org/art-572445#_Toc354589041> [↑](#endnote-ref-8)
9. World Bank Project: Romania - Development Policy Operation – 2012 <http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P130051> [↑](#endnote-ref-9)
10. WB Eastern Electricity Highway Project

 <http://www.worldbank.org/projects/P126579/regional-eastern-africa-power-pool-project-apl1?lang=en> ; <http://www.worldbank.org/en/news/press-release/2012/07/12/world-bank-approves-new-power-transmission-line-ethiopia-kenya-boost-electricity-economic-growth-east-africa> [↑](#endnote-ref-10)
11. 08.08.2013 CAF to provide non-reimbursable technical cooperation to improve Bolivia's electricity, solid waste management and urban transport sectors

<http://www.caf.com/en/currently/news/2013/08/caf-to-provide-non-reimbursable-technical-cooperation-to-improve-bolivias-electricity-solid-waste-management-and-urban-transport-sectors> [↑](#endnote-ref-11)
12. [http://www.afdb.org/en/search/?tx\_solr[q]=PPP&search=Search](http://www.afdb.org/en/search/?tx_solr%5bq%5d=PPP&search=Search) [↑](#endnote-ref-12)
13. IADB Public Utilities Policy July 1996 paras 9, 10,13 <http://cdi.mecon.gov.ar/biblio/docelec/MU2009.pdf> [↑](#endnote-ref-13)
14. IADB ‘Evaluation of the Public Utilities Policy as Applied to the Electricity Sector (PUP-E)’. 2013. *Inter-American Development Bank*. Accessed September 9. http://www.iadb.org/en/publications/publication-detail,7101.html?id=67098 [↑](#endnote-ref-14)
15. IADB ‘Evaluation of the Public Utilities Policy as Applied to the Electricity Sector (PUP-E)’. 2013. *Inter-American Development Bank*. Accessed September 9. http://www.iadb.org/en/publications/publication-detail,7101.html?id=67098 [↑](#endnote-ref-15)
16. IADB ‘Evaluation of the Public Utilities Policy as Applied to the Electricity Sector (PUP-E)’. 2013. *Inter-American Development Bank*. Accessed September 9. http://www.iadb.org/en/publications/publication-detail,7101.html?id=67098 [↑](#endnote-ref-16)
17. [*http://www.miya-water.com/about-miya/our-experts/gesner-oliveira*](https://owa.gre.ac.uk/owa/redir.aspx?C=116c558628914d76a56ca62a4155ce59&URL=http%3a%2f%2fwww.miya-water.com%2fabout-miya%2four-experts%2fgesner-oliveira) ; [*http://www.ifpri.org/sites/default/files/publications/iabrief10.pdf*](https://owa.gre.ac.uk/owa/redir.aspx?C=116c558628914d76a56ca62a4155ce59&URL=http%3a%2f%2fwww.ifpri.org%2fsites%2fdefault%2ffiles%2fpublications%2fiabrief10.pdf) [↑](#endnote-ref-17)
18. ODI Briefing <http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7305.pdf> ; EDFI Annual report <http://www.edfi.be/news/news/30-2012-annual-report.html> [↑](#endnote-ref-18)
19. ODI Briefing <http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7305.pdf> ; EDFI Annual report <http://www.edfi.be/news/news/30-2012-annual-report.html> ; More Than Bricxks and Mortar 2012 The Cornerhouse <http://www.thecornerhouse.org.uk/resource/more-bricks-and-mortar> [↑](#endnote-ref-19)
20. IEA 2012 Measuring progress towards energy for all <http://www.worldenergyoutlook.org/media/weowebsite/energydevelopment/2012updates/Measuringprogresstowardsenergyforall_WEO2012.pdf> [↑](#endnote-ref-20)
21. IEA WEO 2012 Factsheet <http://www.worldenergyoutlook.org/media/weowebsite/2012/factsheets.pdf> [↑](#endnote-ref-21)
22. World Bank/AFD 2010 Africa’s Infrastructure 2010 <http://www.infrastructureafrica.org/aicd/system/files/AIATT_Consolidated_smaller.pdf> p.186

 A range of material based on this is at <http://go.worldbank.org/NGTDDHDDB0> [↑](#endnote-ref-22)
23. WEO 2010: Chapter 8 "Energy poverty - How to make modern energy access universal?" <http://www.iea.org/weo/docs/weo2010/weo2010_poverty.pdf> [↑](#endnote-ref-23)
24. Africa’s infrastructure: challenges and opportunities Antonio Estache Word Bank And ECARES, Université Libre de Bruxelles [http://www.imf.org/external/np/seminars/eng/2006/rppia/pdf/estach.pdf. P.40](http://www.imf.org/external/np/seminars/eng/2006/rppia/pdf/estach.pdf.%20P.40); ESMAP Report 306/05 August 2005 Power Sector Reform in Africa: Assessing Impact on Poor People

[http://wbln0018.worldbank.org/esmap/site.nsf/files/306-05+Final\_to\_Printshop.pdf/$FILE/306-05+Final\_to\_Printshop.pdf#search=%22%22Power%20Sector%20Reform%20in%20Africa%22%22](http://wbln0018.worldbank.org/esmap/site.nsf/files/306-05%2BFinal_to_Printshop.pdf/%24FILE/306-05%2BFinal_to_Printshop.pdf#search=%22%22Power%20Sector%20Reform%20in%20Africa%22%22) [↑](#endnote-ref-24)
25. Source: World Bank/AFD 2010 Africa’s Infrastructure 2010 <http://www.infrastructureafrica.org/aicd/system/files/AIATT_Consolidated_smaller.pdf> p.111 [↑](#endnote-ref-25)
26. Source: World Bank/AFD 2010 Africa’s Infrastructure 2010 <http://www.infrastructureafrica.org/aicd/system/files/AIATT_Consolidated_smaller.pdf> p.111 [↑](#endnote-ref-26)
27. IPPs in Sub-Saharan Africa: determinants of success. Anton Eberhard and Katharine Nawaal Gratwick September 2010 <http://gsbnet.uct.ac.za/MIR/admin/documents/AE%20IPPs_30_8_2010_28995.pdf> [↑](#endnote-ref-27)
28. World Bank/AFD 2010 Africa’s Infrastructure 2010 <http://www.infrastructureafrica.org/aicd/system/files/AIATT_Consolidated_smaller.pdf> p.186

 A range of material based on this is at <http://go.worldbank.org/NGTDDHDDB0> [↑](#endnote-ref-28)
29. Dagdeviren, H., 2009. LIMITS TO COMPETITION AND REGULATION IN PRIVATIZED ELECTRICITY MARKETS. Annals of Public and Cooperative Economics, 80(4), 641-664. Available at: <http://dx.doi.org/10.1111/j.1467-8292.2009.00395.x> [Accessed November 10, 2009]. [↑](#endnote-ref-29)
30. Hall D. 2007 **Electrifying Africa** <http://www.psiru.org/reports/2007-01-E-Africa.doc> [↑](#endnote-ref-30)
31. Bezerra, B., S. Mocarquer, L. Barroso, and H. Rudnick. 2012. ‘Expansion Pressure: Energy Challenges in Brazil and Chile’. *IEEE Power and Energy Magazine* 10 (3): 48–58. doi:10.1109/MPE.2012.2188665 <http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6185787&tag=1> [↑](#endnote-ref-31)
32. IEA 2012 Measuring progress towards energy for all <http://www.worldenergyoutlook.org/media/weowebsite/energydevelopment/2012updates/Measuringprogresstowardsenergyforall_WEO2012.pdf> [↑](#endnote-ref-32)
33. Dubash N. (ed.) 2002. Power politics: Equity and environment in electricity reform. World Resources Institute. August 2002.. Chapter 8: South Africa [http://pdf.wri.org/powerpolitics\_chap8.pdf](http://pdf.wri.org/powerpolitics_chap8.pdf%22%20%5Ct%20%22new) ; Eskom Annual report 2006 . Chief executive's report. <http://www.eskom.co.za/annreport06/chiefexecutivesreport.htm> ; Taryn Dinkelman, 2008. The Effects of Rural Electrification on Employment: New Evidence from South Africa. University of Michigan Job Market Paper Available at: <http://faculty.ucr.edu/~jorgea/econ261/electricity.pdf> [Accessed November 10, 2009]. [↑](#endnote-ref-33)
34. Christian Science Monitor September 22, 2010 Privatizing electricity puts Nigeria on the right track: IEA economist

<http://www.csmonitor.com/World/Africa/2010/0922/Privatizing-electricity-puts-Nigeria-on-the-right-track-IEA-economist> [↑](#endnote-ref-34)
35. WEO 2008: Chapter 15 “Prospects in oil- and gas- exporting sub-Saharan African countries” <http://www.iea.org/weo/database_electricity/WEO2008-Chapter%2015.pdf> [↑](#endnote-ref-35)