

# Electrification in sub-Saharan Africa: The role of international institutions

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## Introduction

Africa's access to electricity varies by region: North Africa is almost entirely (99 per cent) electrified; in sub-Saharan Africa excluding South Africa (SSA), electrification rates in most countries are below 30 per cent; and South Africa is predominantly (86 per cent) electrified. Lack of access to electricity in SSA is even more dramatic in rural areas, where electrification rates average 16 per cent, compared to 99 per cent in North African countries and 71 per cent in South Africa.

Since 2014 the number of people without access to power in SSA has declined, as electrification efforts have surpassed population growth. Decentralized renewable-energy solutions play an increasing role in this trend. However, around 590 million people in SSA continue to lack access to power, more than half of the world's total.

Lack of access is not the only component of SSA's electrification challenge. Even among people who do have access to electricity, there are wide disparities in annual per capita consumption between the three regions: 225 kilowatt-hours (kWh) in SSA – and as little as 100 kWh in rural areas – compared to 1,500 kWh in North Africa and 4,200 kWh in South Africa.

Thus, two-thirds of SSA's population does not have access to power, while the remaining one-third cannot consume as much as it would like, due to regular blackouts and brownouts resulting from structural problems in the electrical system.

Making power available to all by 2030, in line with the UN Sustainable Development Goals, is therefore a major challenge for Africa, notably for financial reasons.

The International Energy Agency estimates that cumulative investments between 2017 and 2030 under current policies and commitments are less than one-fifth of the amount needed to achieve universal electricity access in SSA, which it estimates at \$454 billion, an average of \$35 billion per year.

How to meet this substantial investment requirement? The issue is complex, and no simple solution exists. However, two points seem to be essential:

1. SSA countries should reform their power sectors to facilitate international investment.
2. The international public financing made available for Africa's electrification should be better used, in order to encourage international private investments in the sector.

## Sub-Saharan African countries should first reform their power sectors to facilitate investments

SSA countries should be the key drivers of their own energy development. They have the resources to do so, and to realize the policy ambitions of governments throughout the region to improve the reliability and coverage of their power systems. But this potential can only be unleashed by creating sufficient opportunities for investment. This challenge extends well beyond the power sector, and meeting it will require a reduction of the risks arising from macroeconomic and political instability and from weak protection of contract and property rights. But it will also require specific reforms in the power sector as well – in particular, two key reforms:

1. *Reform of power utilities* – today, SSA power utilities are not financially sustainable. Almost all of them run in quasi-fiscal deficit and thus need to be subsidized by the state.

2. *Reform of energy subsidies* – SSA countries spend around \$25 billion every year in energy subsidies, mainly of inefficient and wasteful electricity utilities and, in certain cases, of old forms of energy, like kerosene.

### **The key role of international public finance initiatives in fostering Africa's electrification**

International public finance institutions, such as multilateral development banks and national development agencies, could channel international private investments into Africa's power sector by establishing dedicated blended finance tools and/or risk-sharing mechanisms.

The combination of political risks (e.g. corruption), commercial risks (e.g. capacity of consumers to pay their bills), lack of stable power market regulatory frameworks, and lack of adequate power infrastructure, currently discourage private investment. On the other hand, international official development assistance and other official flows to the African power sector have quadrupled over the last decade, increasing from \$2 billion in 2005 to \$8 billion in 2015.

The World Bank Group, European Union (EU) institutions and member states, and the African Development Bank disbursed most of the funds in the sector, while other players – including the United States, the Climate Investment Funds, the Arab Fund for Economic and Social Development, and the OPEC Fund for International Development (OFID) played a far smaller role.

Investors have focused on different energy sectors, with the World Bank Group investing mainly in non-renewable power generation (particularly coal), the EU in renewable power generation (hydro, wind, and solar), and the African Development Bank in power transmission and distribution infrastructure. Their geographic focus has also been different. For instance, over the last decade the EU was the main international public investor in North Africa, followed by the Climate Investment Funds, the Arab Fund for Economic and Social Development, OFID, the United Arab Emirates, and others. The African Development Bank also played a significant role in the region, while the World Bank Group was only marginally engaged there. In SSA (excluding South Africa), the major investors were the World Bank Group, the EU, and to a lesser extent the African Development Bank. The African Development Bank and the World Bank Group were the key players in South Africa.

China has also played a substantial role in Africa's power sector, but that country does not disclose precise information about its development finance flows to Africa, and only unofficial estimates exist. According to the International Energy Agency, Chinese companies (90 per cent of which are state-owned) were responsible for 30 per cent of new power capacity in SSA between 2010 and 2015, with a total investment of around \$13 billion. Chinese contractors have built or are contracted to build 17 gigawatts of power generation capacity in SSA from 2010 to 2020, equivalent to 10 per cent of existing installed capacity. These projects are widespread across SSA, in at least 37 of the region's 54 countries. Chinese contractors primarily focus on large projects involving traditional forms of energy like hydropower (49 per cent of projects 2010–2020), coal (20 per cent), and gas (19 per cent); their involvement in modern renewables remains marginal (7 per cent).

Africa is also part of China's One Belt, One Road initiative. That initiative includes not only the 'Silk Road economic belt' stretching from Asia to Europe, but also the 'maritime Silk Road' linking China and Europe via the Indian Ocean littoral and East Africa. According to a Boston University study, China has invested about \$128 billion in energy projects in Belt and Road countries since 2001. Of this investment, \$4.1 billion has targeted Africa – predominantly to develop coal-fired power plants. In this initiative, China thus seems not to consider the environmental and social issues that currently prevent the majority of international financing institutions from supporting coal projects in Africa. China's focus on coal and big hydropower projects makes international financing institutions' support for solar and wind energy projects in Africa even more important.

## **Limitations to the current system**

The increasing international support for Africa's electrification is good news for the continent, but it is not sufficient to bridge the gap between current investments and those required to provide access to power to all by 2030. The most promising way to bridge this gap is to scale up international private investment; and for that to occur, domestic reforms are needed to create a viable and attractive investment environment.

International financial assistance for Africa's electrification should also evolve to assert more leverage over private investors, and over African governments by incentivizing energy market reforms. In this regard, the main issue is coordination.

Around 60 international initiatives – originating in Europe, America, the Middle East, and Asia – are currently contributing to the development of energy markets and the improvement of access to power in Africa.

As outlined by the Africa Progress Panel in 2015, Africa's energy needs are poorly served by such a fragmented system. This is because funding is generally delivered through overly bureaucratic structures that combine high transaction costs with low impact, resulting in most finance being earmarked for small-scale projects rather than sizeable programmes.

Global financing initiatives for Africa's electrification are broad in scope and eclectic in focus. Taken in isolation, this might be considered as good news, as it signals widespread global support for Africa's electrification. However, when considering that 92 per cent of the last decade's international financial support to Africa's electrification came from only three sources (the World Bank Group, African Development Bank, and EU), there likely remains a coordination issue between these large well-established funders and the multitude of new initiatives.

The EU's presence appears particularly fragmented, with 26 initiatives originating from member states and EU institutions. The variety of member states' initiatives is understandable, as each country has its own political and commercial interests. What is less understandable is the fragmentation of EU institutional initiatives. This fragmented system seems to favour overlaps, inefficiencies, and higher transaction costs. European taxpayers' money would arguably be better spent if channelled through a single facility, allowing policy consistency, elimination of overlaps, reduction of transaction costs, and therefore higher efficiency and impact.

The World Bank Group, African Development Bank, and United States have streamlined their activities, focusing resources on a few initiatives, and thus do not appear to be contributing to the fragmentation problem. For instance, the African Development Bank, in addition to its traditional financing tools, has established two initiatives: The New Deal on Energy for Africa (a public-private partnership between the Bank, African governments, and the global private sector aimed at establishing innovative financing for energy projects), and Africa50 (an infrastructure fund owned by the Bank, African governments, and global institutional investors, created to mobilize long-term savings to promote infrastructure development). The United States mainly acts through Power Africa, a public-private partnership launched in 2013 involving 12 US government agencies, African governments, other multilateral partners, and more than 100 private-sector partners including energy companies, investment banks, equity funds, and institutional investors.

## **Making the most of international assistance**

Electrification is a major requirement for socioeconomic development in SSA. Achieving it requires joint action by SSA countries and the international community.

SSA countries should reform the governance of their energy sectors – in particular, of power utilities and energy subsidies. Without this, they will not attract international private investment at the scale needed to achieve electrification or other elements of Agenda 2030.

International financial and development institutions need to offer more than financial support for Africa's electrification. Increased technical assistance is also critical. International institutions with solid experience in infrastructure financing could enhance Africa's 'soft' infrastructure of national governments and institutions by supporting the development of sound energy policies, regulations, incentive systems, sector reforms, corporate governance, and transparency and accountability best practices. Programmes like the New Deal on Energy for Africa and Power Africa, described above, are already contributing to this effort.

Calls for better coordination and cohesion in the development arena are ubiquitous, and there are relatively few success stories. Still, the way to make the most of the global financing initiatives for Africa's electrification could be to establish a coordination or information-sharing mechanism to better track the sector's rapid changes and keep key actors and stakeholders informed. Given its global outreach and considering its attention to the issue of energy access, the International Energy Agency could be the right institution to run such an initiative.

International financial support is particularly vital for the three-fifths of the SSA population living in rural areas. Developing small-grid and off-grid power solutions in rural areas is often highly challenging due to geographical or economic constraints. With declining costs and increasing performance for small hydro, solar photovoltaic, and wind power generation as well as electricity storage and control systems, small-grid and off-grid renewable energy systems could become game-changers for SSA rural electrification, in a decentralized and modular manner. However, these innovative energy solutions face two major barriers.

1. While their operating expenses are low, they require substantial up-front capital investment. In SSA, country, regulatory, and commercial risks substantially increase the return expectations of investors and thus any project's capital costs. This discourages capital-intensive energy options and encourages less capital-intensive, conventional energy technologies.
2. They are characterized by high transaction costs. For instance, the transaction cost per kWh of electricity produced from a hydropower plant is lower than the sum of the costs of the hundreds of transactions required for comparable capacity from solar photovoltaic or wind power.

International financing institutions could play a truly vital role in making a stronger case for investment in rural electrification solutions.

Europe would need to make a particular effort to coordinate its many existing programmes in the region. This is the only way Europe can make a significant contribution to SSA's electrification challenge, in terms of both crowding-in private investments and stimulating SSA countries' energy sector reforms. Coordinating current and prospective European programmes for SSA electrification through the recently established EU External Investment Fund could represent a pragmatic way to achieve this.

## **Electrification and climate change**

In addition to its relevance for SSA's socioeconomic development, electrification has important implications for climate change. The United Nations has predicted that Africa will experience greater population growth than any other region, from 1.2 billion in 2015 to 2.5 billion in 2050. Energy demand is likely to grow accordingly. Thus, ensuring a sustainable energy mix for Africa is crucial to avoiding a negative impact on climate, and efficiently supporting Africa's sustainable electrification should be seen by international actors as an important component of their overall climate change mitigation effort.

In this regard, the potential for a new global North–South financial cooperation should also be considered. Financial resources from Europe and North America could be invested in green assets in the global South, and notably in Africa. This would allow investors to earn higher returns, while helping to improve living conditions for the world's poorest and to mitigate climate change. It is up

to African countries themselves to initiate this virtuous cycle – by making the reforms necessary to create a favourable investment environment.