

COVID-19 and the African energy sector

Energy Insight

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Overview

As elsewhere in the world, COVID-19 continues to ravage Africa¹, causing thousands of deaths and an unprecedented health crisis that is damaging to every aspect of the social and economic lives of millions of people. The energy sector is among the hardest hit², with far-reaching consequences for access to electricity for millions of Africans. Drawing on key COVID-19-related energy tracker reports and recent studies³, this Insight Paper argues for stimulus packages that enhance universal access to sustainable electricity. Policy responses always need to be context-based, as different African countries and regions face different challenges and opportunities. That said, we argue here that the dominant paradigm of energy development in Africa, based on capital-intensive investment in generation projects with long-distance transmission systems, may be particularly vulnerable to crises such as the COVID-19 pandemic. We suggest therefore that a more diversified and resilient energy system should be mainstreamed in Africa in the post-COVID era. We note that there will be tremendous financial, political, and ideological obstacles to such a paradigm shift taking place, which will require active engagement and coordination among governments, donors, and businesses to address.

Focusing on the electricity sector, in this paper we briefly discuss the status of the development of the electricity sector in Africa before the crisis, how that development pathway has been interrupted by the pandemic, and what the potential opportunities are, particularly for renewable energy systems. We conclude the paper with concrete policy suggestions that respond to both the challenges and opportunities.

Africa's energy development before the crisis

Even before the COVID-19 outbreak, Africa was the most energy-poor region in the world (International Energy Agency (IEA), 2019; Sustainable Energy for All (SEforALL), 2020). Its energy use per capita is around one-third of the world's average (World Bank Data, 2020). The most recent data show that over 50% of the continent's population (about 600 million people) have no access to electricity (SEforALL, 2020). The consequences of such deprivation are immense and are manifested in increased health, socio-economic, and environmental problems. Reliable data are hard to come by but a World Health Organization- (WHO-) led study of 11 sub-Saharan countries found that on average one in four health facilities had no access to electricity, while only 28% of health facilities and 34% of hospitals had what could be described as a reliable electricity supply (Adair-Rohani *et al.*, 2020), which exacerbates vulnerability to COVID-19.

Sub-Saharan Africa faces many challenges in trying to provide universal access to affordable, reliable, and sustainable energy (Sustainable Development Goal (SDG) 7), not least the following:

- Investment in the African energy sector has been low. While Africa is home to 17% of the world's population, it currently accounts for just 4% of global power supply investment (IEA, 2019). Beside the overall shortage of finance, there are tremendous imbalances regarding the distribution of investment between different sources of energy and between the power generation and distribution. Out of US\$ 100 billion investment in the energy sector in Africa between 2014 and 2018, US\$ 70 billion was invested in fossil fuels and US\$ 13 billion in renewables, while US\$ 13 billion was invested in grid networks (IEA, 2019). Estimates show that achieving a reliable electricity supply for all would require an almost fourfold increase in investment, to around \$120 billion a year to 2040 (IEA, 2019).
- Most African countries rely heavily on foreign capital and technology to develop their critical energy infrastructure and are therefore vulnerable to external shocks. Moreover, African markets are highly fragmented as each country's market potential is relatively small, and it is hard to achieve economies of scale for large

¹ See: <https://covid19.who.int/>.

² See, among others, Akrofi and Antwi (2020).

³ See, for example, IEA (2020) and IRENA (2020).

investment in infrastructure and manufacturing facilities.

- Many energy utilities are in a difficult fiscal position, with high debt burdens, insufficient funding support, and unprofitable markets, leading to the risk of insolvency and the consequent need for government bail-outs (Oosthuizen *et al.*, 2018). There are concerns among potential investors over governance, particularly around political instability and the

often incoherent policy support for renewable energy development (Verisk Maplecroft, 2019).

As we show below, all these intertwined challenges have been exacerbated by multiple impacts of the COVID-19 pandemic, such as disruption to the construction of energy infrastructure and to new planned project negotiations, as well as the deteriorating capacity to service debt among off-takers.

COVID-19-related impacts on the Africa energy sector

Context

A positive side of COVID-19 has been a reduction in CO₂ emissions due to travel restrictions and factory closures during lockdowns. Globally, CO₂ emissions are expected to decline by 8% in 2020, falling to their lowest level since 2010⁴. That said, the pandemic has also posed numerous challenges and problems for governments around the world. Following the WHO's declaration of the pandemic on 11 March 2020, no fewer than 140 measures have been taken by different African countries, including laws, regulations, and executive orders that aim to combat the spread of the disease⁵. Some countries have declared a state of emergency, leading to a partial or full lockdown. Africa has so far registered relatively low numbers of confirmed cases and deaths⁶, but this may be partly due to limited testing capacity and reporting systems in many countries. The situation on the continent is highly heterogeneous and progress varies considerably (Lancet, 2020). Along with the effects of the global economic downturn, COVID-19 has had major socio-economic consequences for the health, food, housing, and jobs of millions of Africans (African Development Bank (AfDB), 2020). At the continental level, gross domestic product is estimated to shrink by 2.8% in 2020 (World Bank, 2020a), pushing 40–60 million people back into extreme poverty (World Bank, 2020b). COVID-19-induced sovereign debt crises, combined with a reduction in remittances and contracting foreign direct investment, are predicted to cause up to 30 million job losses (AfDB, 2020). Beyond these

general challenges lie a range of specific problems faced by the energy sector, listed below.

⁴ IEA: www.iea.org/reports/world-energy-model/sustainable-development-scenario

⁵ See ICNL Tracker here: www.icnl.org/post/analysis/african-government-response-to-covid-19.

⁶ See WHO Africa: www.afro.who.int/health-topics/coronavirus-covid-19.

Falling energy demand

For the energy sector, oil producing countries have experienced shocks from plummeting oil prices as global demand for liquid fuels has fallen, although arguably oil importing nations have benefited from the price drop (AfDB, 2020). Another immediate impact has been on electricity demand, as the lockdown has resulted in significant reductions in commercial and industrial electricity usage, despite rising consumption of household electricity usage in some areas (IEA, 2020). For example, Zimbabwe's overall demand has declined by 25% since its lockdown on 30 March 2020 (Akrofi and Antwi, 2020).

Disruption of global value chains for energy equipment.

The disruption of global value chains for energy equipment was particularly an issue in the first quarter of 2020 when China – as the world's most important producer of renewable energy technology – was the epicentre of the outbreak. Its solar module production declined by 20–25% in January–February 2020 (International Renewable Energy Agency (IRENA), 2020). Although from April Chinese module exports gradually resurged to previous levels, Chinese customs data reveal that year on year sales of solar panels in May decreased by around 6%. Meanwhile, ongoing negotiations on various infrastructure projects were also halted across a number of African countries. The pandemic has had a particularly significant impact on distributed renewable energy systems. A recent survey conducted by the Global Off-Grid Lighting Association shows that half of off-grid energy companies face substantial financial challenges, while the majority of solar home system suppliers have funds to cover only two months' operating expenses (Akrofi and Antwi, 2020).

Impacts on investment

The impacts of COVID-19 on large-scale energy infrastructure vary by country and energy source. In some cases plans are unaffected. For example, the Great Ethiopia Renaissance Dam (GERD) completed its early phase of filling on schedule in July 2020, amid both the pandemic and heated tensions among the neighbouring countries of Sudan, Egypt, and Ethiopia (Salam, 2020). In other cases the crisis may have provided an opportunity or cover for projects to inch forward. The Democratic Republic of Congo (DRC), for instance, chose to announce its reinforced commitment to the Inga 3 project, which is expected to have a severe impact on local communities' livelihoods and access to fresh water (International River, 2020a), at a time when COVID-19 had changed the campaign strategies of several local social organisations working against the project (International Rivers, 2020b). That said, in general, large investments in hydropower stations remain vulnerable due to waning private sector enthusiasm – global investment is expected to decrease by 20% (or almost \$400 billion) compared to 2019 (IEA, 2020). Meanwhile, public financial support is likely to shrink as public spending priorities shift to combating the pandemic.

Existing infrastructure – maintenance and debt servicing

COVID-19 has also had significant impacts on existing energy projects, in terms of maintenance and debt services. Many independent power producer (IPP) projects may require the renegotiation of power purchase agreements (PPAs) due to the massive instability of energy demand, and loan repayments or sovereign guarantees may also require extension, rescheduling, or even cancellation. In South Africa, for example, COVID-19 has already led to the monopolistic utility ESKOM issuing a number of force majeure notices to curtail generation from independent wind power plants, due to the lower demand after the lockdown, which has consequently led to a decline in income for IPP operators (SAWEA, 2020; Trace and Perera, 2020). Although the pandemic appears to be a force majeure under all major contracts, each party's specific obligations and liabilities can only be agreed via case by case negotiations, which may take months or longer.

In addition, many African countries rely on imports of consumables and spare parts to run their energy infrastructure, and the various lockdowns affect both importing and exporting countries. For technologies with highly globalised supply chains, such as technologies related to wind energy, the difficulties of maintenance can be even greater.

Government response to energy sector after COVID-19

Short-term responses

The first phase of policy measures implemented by African governments have been mainly aimed at containing the spread of the virus and mitigating its effects: strengthening health facilities and addressing the immediate effects of the pandemic on food and shelter, jobs, and social stability. Most governments have implemented fiscal and monetary policy measures, including direct supplementary budgets or allocations, taxes, and interest rate adjustments (AfDB, 2020; Akrofi and Antwi, 2020). Many of the energy policy measures implemented have focused on relieving the energy end users' financial burden by waiving, suspending, and/or reducing electricity bills (Akrofi and Antwi, 2020; AfDB, 2020). For example, Gabon allocated around US\$ 42 million to support the most vulnerable households through the exemption of payment of electricity bills. Likewise, Burkina Faso exempted vulnerable communities from the payment of electricity bills between April and June, while Ghana subsidised electricity bills by 50% from April to June 2020 (AfDB, 2020).

Some countries have adopted policies to incentivise renewable energy deployment during the pandemic. Nigeria has provided relief funds for off-grid energy companies and Burkina Faso has introduced a 50% reduction in the cost of solar kits for vulnerable households (Akrofi and Antwi, 2020). Nigeria's Rural Electrification Agency, over a span of two weeks, installed four solar-hybrid mini-grids to power isolation centres across the country, each with over 100 beds. Various international organisations, including the World Bank, IRENA, SEforALL, and WHO, have also joined forces with African governments to enhance the electrification of healthcare systems as the most urgent response strategy (Brent, 2020; IRENA, 2020).

Many countries have aimed to enhance the reliability of their electricity supply by waiving

In addition to the above, sovereign debt and currency convertibility issues, which had already had some impacts even before the pandemic outbreak in many African countries, continue to be a problem (Coulibaly *et al.*, 2019).

interest rates on utility borrowing and placing bans on disconnections, and postponing or suspending planned power interruptions (Akrofi and Antwi, 2020). Measures focusing on the energy demand side may have significant social and economic stabilisation effects, but providing free or cheaper electricity remains only a short-term solution as delayed payments place an even greater financial strain on utility companies and off-takers, who have assumed the burden of honouring PPAs, particularly considering that many of them are already insolvent or making huge losses. Some countries have witnessed a hike in their electric tariffs: Botswana saw a hike of 22% in the tariff of its national energy corporation, to prevent further loss (Benza, 2020).

Longer-term considerations

Amid all this, debt sustainability has long been a concern and is now even more urgent in some countries (Sallent, 2020). Multilateral and bilateral debt service relief packages are being developed. The G20 has agreed to suspend debt repayment for the world's 75 poorest countries until the end of this year. The World Bank, the International Monetary Fund, AfDB, and all Paris Club creditors are also seeking debt relief/forgiveness solutions. China, as a major creditor, announced debt service suspension for 77 developing countries. Most of these packages will be negotiated and implemented through lengthy processes, and many African countries are hesitant about joining these programmes due to the potential impact on their sovereign rating and future investment, which is crucial for their post-COVID recovery (Mutize, 2020). It is also not yet clear how these debt restructuring negotiations will affect power sector development, as many projects, particularly those with Chinese state bank finance, do not typically fall into the conventional foreign aid category and are therefore more likely to be negotiated on a bilateral basis. The situation is similar for those public

private partnership or IPP projects with no or limited public finance backing. However, what is certain is that for highly indebted countries, it will prove very difficult to finance new power projects by either public or private entities before solutions are found for those projects already in the operation and repayment phase.

In short, the magnitude and range of the impacts of the COVID-19 pandemic on Africa's energy sector

Opportunities for a paradigm shift: enhancing access to sustainable energy

COVID-19 also offers opportunities in regard to avoiding some structural problems in the African energy sector, and building more sustainable and resilient energy systems that are more accessible to all, mainly based on the continent's abundant renewable energy sources. Africa has huge potential to develop renewable solar and wind energy sources (IRENA, 2014) but has barely exploited these to date, for reasons ranging from lack of finance and underdeveloped grid facilities, to insolvent off-takers and insufficient governance capacities. All of these factors appear to be deteriorating further during this pandemic and will probably continue to worsen, particularly once current rounds of urgent relief programmes expire (IRENA, 2014; IEA 2019). In order to tap into Africa's potential some out-of-the-box thinking is needed, regarding which obstacles require priority attention and which innovative measures can have the most impact. We believe that increased access to electricity should be given the utmost priority in the upcoming stimulus packages that many countries are poised to implement as the COVID-19 pandemic subsides. In order to do this a number of issues will need to be addressed.

Investment in transmission and distribution infrastructure

On-grid large renewable energy generation projects will still have potential in many areas, but their completion depends on several factors. On-grid renewable energy requires more reliable grid transmission and distribution systems, particularly for wind and solar sources. Moreover, grid upgrade or expansion normally takes much longer to complete than energy generation facilities like wind or solar parks, and these investments are often not commercially viable on their own. Hence, state-backed or multilateral finance will continue to play a vital role in improving and expanding grid

are huge, at both the demand and supply ends, and for existing and future projects alike. Many of the challenges discussed in this section, such as external debt and fragile supply chains, have been exacerbated by the pandemic. African countries need to rethink their approach to developing more sustainable and resilient energy generation and infrastructure systems.

infrastructure. As a result, due to the foreseeable public funding constraints due to the COVID-19 pandemic, attracting sufficient funding for improving grid infrastructure should be seen as an important precondition for scaling up on-grid wind and solar investment. Previously, countries such as South Africa and China, with notable growth rates for wind and solar energy generating capacities, have experienced severe curtailment due to limited grid capacity. Such a situation needs to be avoided by African countries with ambitious renewable energy targets and plans.

Developing national expertise

Many large-scale renewable energy projects are implemented via public procurement programmes and project finance arrangements, compared to the more traditional bilaterally negotiated model of project development, often with a sovereign guarantee. Public procurement programmes are more transparent and efficient, which can provide stable policy signals to potential investors. However, they require expertise and skills around project finance and legal documents, which is often lacking among African utilities and government agencies. Considering that various existing capacity building and training programmes may have been postponed or cancelled due to COVID-19, ensuring continued intellectual support from donors is crucial for the future success of renewable energy procurement in Africa countries.

Another concern relating to developing large-scale renewable energy projects is the need for technology transfer to support the development of local industrial capacity. Given the disruption of supply chains in many key renewable energy equipment areas, the need to localise at least some parts of the production chain within African countries has become clear. Green industrial

policies that encourage joint ventures or technology transfers are often seen in procurement programmes in Africa. These policies not only aim to enhance generation capacity from renewable energy sources but also to build domestic manufacturing capacities in the long run. For example, local content requirements are increasingly popular in procurement contracts. However, such policy initiatives face two notable challenges in the African context. First, local content requirements under public procurement often further discourage an already limited investment appetite due to the notable increase in transaction costs associated with securing local partners. Second, most leading technology suppliers may only agree to technology transfer or invest in manufacturing capacity in large and stable markets. As most African countries have relatively small domestic markets, renewable energy companies are often deterred from investing in manufacturing facilities in African countries.

Regional integration or coordination of markets

In general, renewable energy systems are more resilient, flexible, and less capital-intensive than conventional systems, such as large hydro or thermal power stations. Wind and solar systems have exhibited strong resilience compared to traditional energy facilities during the COVID-19 crisis, and offer huge potential for future development (IEA, 2020). Decentralised systems could provide critical energy supply for rural households and key infrastructure, such as hospitals and schools, many of which are still unelectrified. In the medium run, on-grid and off-grid solar and wind systems may avoid several structural problems such as the severe construction or implementation delays often encountered on gigantic projects, the shrinking investment appetite, and long sovereign debt negotiations (IRENA, 2020). Achieving such fundamental shifts in national energy systems will require that a number of political, market, and even ideological barriers are overcome, and will require more ambitious innovations as regards new policy instruments, business models, and financial packages being

Conclusion and recommendations

Both distributed and large-scale renewable energy systems have tremendous potential and are well positioned to take the lead in the next phase of energy transition in Africa, given their resilience,

developed that are significantly different to those of the previous era.

This leads to a related question: how to strategically develop regionally integrated or coordinated markets and to plan energy generation facilities among different African countries? A credible and implementable regional renewable energy development plan for both electricity generation and transmission and for technology transfer would be helpful to encourage investors to engage with African markets more seriously, particularly on the upstream production for raw materials and manufacturing facilities. Normally, green industrial policy refers to national government intervention in developing its own green industries in a rather protectionist approach, to nurture domestic manufacturing capabilities. Given the market fragmentation among African countries, however, enhancing regional attractiveness and selecting the most appropriate power generation sites to cover fluctuating regional demand is beyond the capacity of individual African governments. A coordinated effort is necessary to do this, and to prevent unnecessary competition in establishing manufacturing facilities. Given the constrained budgets of most multilateral agencies, investing in and supporting regional institutions could be a more efficient approach compared to previous country by country approaches.

Distributed systems

Decentralised and distributed systems could also play a more important role than mega infrastructure projects in the future. Experience in other developing regions indicates that distributed systems and bottom-up approaches can play a very important role in rapidly reducing energy poverty, but this is often overlooked. For example, China built over 65,000 small hydropower stations in the 1960s and 1980s, mainly via village crowdfunding, which helped to boost the rural electrification rate from under 50% to 88%. India's recent fast-paced approach to eliminating energy poverty through its 'Saubhagya' programme has also included provision of solar home systems in remote areas.

flexibility, and lower reliance on the severely constrained public finance that pertain across most of the countries in the region. Future pathways should look at a more diversified and balanced

strategy across on-grid, mini-grid, and off-grid systems. However, the challenge of breaking away from the traditional pathways, that rely on large-scale infrastructure projects backed by state or multilateral finance, at global, regional, national, and local levels, should not be underestimated. At the global and regional level, enhancing African markets' attractiveness and integration in global markets and supply chains is key. At a national level, adjustments to energy planning are required to provide flexible but stable policy signals with clear priority and implementation routes. At a local level, mitigation of social security risks and the establishment of transparent and effective dispute settlement procedures are needed. To achieve these visions, African governments will need to play a central role, as will other stakeholders.

COVID-19 – despite the ravages it has caused – presents opportunities to accelerate the clean energy transition in Africa. However, to seize these opportunities governments should quickly adjust their current energy plans and strategies, focus on the most urgent tasks in the short run, and prepare for a paradigm shift in the medium and long term. This will involve four key areas of action:

- Firstly, given shrinking energy demand and investment and debt rescheduling talks, African governments and donors should prioritise increasing energy access as a key response to the COVID-19 crisis (Brono and Kirshner, 2020), particularly when considering the focus of upcoming stimulus packages. In the short run, governments should focus on both electrified and unelectrified populations to make sure policies such as tariff cuts or electricity bill waivers do not exacerbate existing energy access injustices. Electrification rates should outweigh other key indicators, such as installed capacity or power generation, for energy sector development in most African countries. Energy is a key catalyst for economic recovery – helping to expand the production of goods and services, regain lost jobs, and create new job opportunities, as well as allowing more people to work from home, learn online, and reduce CO₂ emissions.
- Secondly, more prudent budgeting should be carried out immediately by African governments (and their bilateral and multilateral support agencies), given limited public funding availability for the foreseeable future. For already planned infrastructure projects, re-screening is needed to prioritise the most essential activities, balance the investment between energy generation and transmission, and secure support for the most needed capacity building programmes, etc. This process will be highly political, and governments must exert autonomy in decision making and focus on country-specific context and long-term interests, and avoid being unduly influenced by incumbent sector suppliers and technologies. Readjustment plans should be based on efficient coordination with the private sector and international donors, and the process should remain transparent.
- Thirdly, innovative financial instruments and business models should be nurtured from the bottom up, particularly for mini-grid and off-grid programmes. Traditional financing sources and models for large energy infrastructure (development finance, foreign aid, and foreign direct investment) are increasingly constrained, while sovereign guarantees are less realistic in a post-COVID scenario. A crucial role may now be played in many African countries by innovative financial instruments, including carbon or climate finance, impact investment, crowd funding, and green bonds, all of which may be more applicable for mid- and small-scale renewable energy projects. Although all of these instruments have been experimented with in some countries, scaling up is still a big challenge. Innovations are required for almost every aspect of projects, from new business models to various credit enhancement schemes. In addition, local governments and rural communities need to be motivated and encouraged to provide more active contributions in rural electrification programmes and in the development of local distributed renewable energy systems.
- Fourth and finally, the possibility of regional cooperation among African countries for coordinated technology development and investment should be explored. For example, organisations such as the East, West, and Southern Africa Power Pools (EAPP, WAPP, and SAPP), which are currently responsible for developing a more unified electricity market in these regions, could also be encouraged to facilitate cooperation among member countries and with international agencies in planning key energy generation sites or facilities within the

region. A convincing regional renewable development plan for both energy generation and transmission, and for technology development, would significantly incentivise private investors to consider African markets more seriously. For example, the investment in solar panel production facilities in South Africa by a leading Chinese firm Jinko is based on its estimation of growing demand within the southern African region. Some upstream production of raw materials, such as solar wafers or certain spare parts for project maintenance, have significant potential if more stable market prospects and better policy support can be engendered.

To conclude, the COVID-19 pandemic will have fundamental impacts on Africa's energy transition, because of both the continent's fragile internal situation and its vulnerability to external shocks. Shrinking energy demand, construction interruption, and the debt service crisis are examples of impacts caused by COVID-19 that are threatening the achievement of SDG 7 and the goal of universal energy access in Africa. However, the COVID-19 pandemic also provides an opportunity to address some structural issues in energy development, and to rethink alternative pathways led by renewable energy sources like wind and solar, which have proven to be more resilient and flexible in adapting to this unprecedented crisis. Realising the potential of renewable energy, however, requires immediate policy adjustments that make energy access in rural and urban areas a priority. It also requires more prudent and wise planning for generation and transmission infrastructure, the development of bottom-up innovations for off-grid and mini-grid systems, and a more coordinated regional cooperation mechanism to attract private investors.

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