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Applied Research Programme

The Impacts of COVID-19 on the Power Sector in Low and Middle Income Countries

Update on the International Energy Sector Organisations' Response

Energy Insight

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The COVID-19 pandemic has fundamentally impacted on the economic, political and social make-up of the global economy. In May 2020, our EEG Energy Insight provided a snapshot of the support being provided to the energy sector by international organisations amidst the COVID-19 pandemic. This Energy Insight provides an update just over one year on, focusing on three keys areas: 1) the emerging picture of the impact of the pandemic on the sector, 2) the short term emergency responses by governments and international organisations, and 3) whether any evidence exists to support the hypothesis developed in our previous Energy Insight, that the pandemic may stimulate new investment to improve sector resilience and to speed up the energy transition. We separate our analysis, where appropriate, between impacts on the on-grid and off-grid power sectors.

Update on the impact of the COVID-19 pandemic on the power sector

Pandemic slows progress towards SDG7 and, in some countries, progress is reversed.

The overwhelming concern is that the pandemic has reversed several years of progress towards achieving universal energy access when the world was already set to fall short of the target to ensure universal access to sustainable, affordable, modern and reliable energy by 2030 (the UN Sustainable Development Goal 7). The latest SDG7 Tracking Report for 2021 suggests that while the share of people with access grew to 90% in 2019, 759 million people still lacked access to energy at that point. The IEA estimates that 6% of the connected population in Sub-Saharan Africa (approximately 30 million people) who had access to electricity in 2019 will no longer have been able to afford basic electricity services during 2020 – with Nigeria, Democratic Republic of Congo and Niger being amongst the worst-hit countries. Recent analysis from the Sustainable Development Solutions Networks showed that of the 54 Sub-Saharan African countries, only Gabon remains on track to achieve SDG7. Based on existing stated national policies, the IEA estimates that 660 million will still lack access to energy by 2030 and that 940 million will need to be connected between now and 2030 in order to achieve SDG7. This suggests that the access rate will need to triple – to an annual rate of 85 million people in Sub-Saharan Africa alone.

On-grid supplies - major impacts reported on utility financial viability

The International Energy Agency (IEA) in its latest World Energy Outlook 2020 estimated that global energy demand dropped by 5% in 2020.[1] The International Renewable Energy Agency (IRENA) suggests a similar figure in its Post-COVID Recovery Report 2020, and that the contraction in energy demand was several times more than the contraction seen in the 2008-09 financial crisis.[2] The Report goes on to say that weekly energy demand fell by 25% in countries that imposed lockdowns during the first wave of the pandemic, and by 18% where there were partial lockdowns. The initial response to the pandemic by the energy sector was, apart from addressing health and medical concerns, to impose emergency measures focused on maintaining a secure energy supply, as well as extending support to energy consumers and hard-hit end-use sectors.

The instigation of lockdowns and restrictions on social gatherings had a pronounced impact on the operation and financial viability of grid systems across the world. A report commissioned by EEG from the Ugandan Electricity Regulatory Authority in August 2020 noted that "between the months of March and April 2020, there was a 24% decline in purchases of bulk electricity from the transmission company, a 29.1% decline in energy sales to customers, a 30.6% increase in energy losses and a 20.8% reduction in revenue collection".

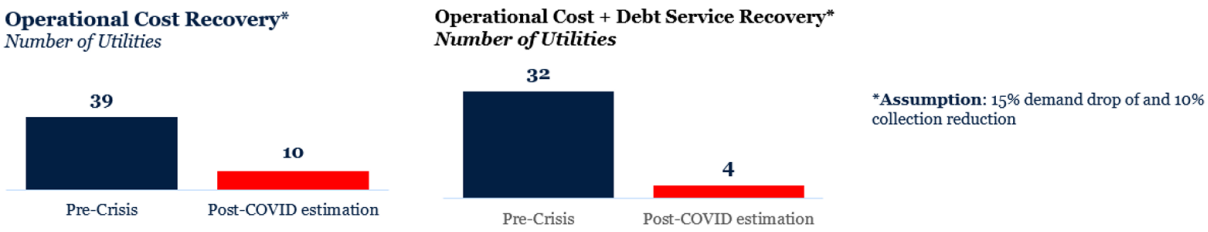
Earlier, in May 2020, the World Bank's ESMAP team presented analysis on the State of African Utilities Pre- and Post-COVID-19 at a Utility CEO Forum webinar on "The State of African Utilities Pre- and Post-COVID-19". During this event, the ESMAP shared its approach to creating a framework for assessing the performance of electricity utilities in Sub-Saharan Africa, and understanding the state of these utilities; as well as preliminary analysis. To the best of our knowledge, there has been no available update to the initial analysis that was presented. The analysis, based on the ESMAP State of African Utilities Database, focuses on performance against financial, operational and accountability indicators for 78 utilities in 46 countries across East, West, Central and Southern Africa. Of the 78 utilities under study, 40 are vertically-integrated utilities and 20 are distribution only. The analysis shows that the resilience of utilities as the pandemic took hold in 2020 differed markedly across the continent and this difference was influenced by: the extent

[1] https://iea.blob.core.windows.net/assets/80d64d90-dc17-4a52-b41f-b14c9be1b995/WEO2020_ES.PDF

[2] https://www.irena.org/publications/2020/Jun/Post-COVID-Recovery

of off-take IPPs (for example, in Kenya and Mozambique, plummeting demand likely impacted KPLC and EDM's ability to pay IPPs); the fuel supply mix (in Senegal, low oil prices lowered generation costs); exposure to foreign exchange risk; economy-wide and sector-specific measures; and the type of metering, billing and payment systems. ESMAP's analysis also shows that, pre-COVID, under half of the 78 utilities, regardless of their type, were able to fully recover their operating and debt costs: 20 out of 35 VIUs (although 8 achieved this with operational and/or capital subsidies); and 2 out of 6 transmission-only utilities; and 6 out of 20 distribution-only utilities. ESMAP's estimations in the first few months of the pandemic were that the number of utilities able to recover both their operational costs and service their debts would plummet from 32 to 4 post-COVID (see Figure 1 below).

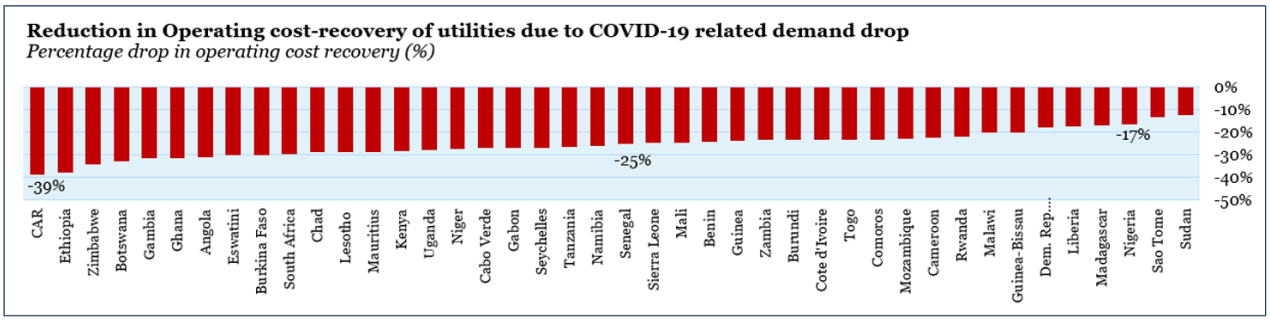
Figure 1: Estimated Impacts of COVID-19 on Electric Utilities



Source: World Bank ESMAP State of African Utilities Database, Utility CEO Forum Virtual Event (May 2020)

Figure 2 below shows the estimated drop in operational cost recovery owing to the drop in demand due to COVID-19, ranging from falls of almost 40% in the Central African Republic to 10-15% in Sudan.

Figure 2: Estimated reduction in African utilities' operational cost recovery due to COVID-19



Source: World Bank ESMAP State of African Utilities Database, Utility CEO Forum Virtual Event (May 2020)

On-grid supplies - continued uncertainty moving forward

The above figures are now a year old and should thus be treated with some caution. What is clear however is that the situation is not yet stable. For example, an EEG paper published in November 2020[3] tracked a reduction in electricity demand across Bangladesh, Bhutan, India and Nepal of as much as 25% over the period March to April 2020, during periods of lockdown, followed by a rebound of demand to almost pre-lockdown values in May 2020, while India has recently again reported a 6.2% drop in demand during the first half of May 2021 compared to the second half of April 2021 as a result of new lockdowns[4]. On that basis, in the short term at least the impact of COVID on utility financial viability are likely to continue for some time to come.

[3] https://energyeconomicgrowth.org/publication/learning-covid-19-experience-framework-resilient-regional-electricity-grid-bangladesh

[4] https://www.reuters.com/world/india/indias-electricity-use-falls-may-due-covid-19-lockdowns-2021-05-17/

Off-grid supplies - profoundly negative impact in 2020

The pandemic continued to have a profoundly negative impact on operations and long-term resilience of the off-grid sector, and access to finance continued to be a pressing concern throughout 2020. The EnDev programme's Energy Access Industry Barometer provides a comprehensive and inclusive assessment of the constraints experienced by the off-grid sector during the early stages of the pandemic, and is a guide to investors, governments and donors in developing effective and tailored support. The EnDev survey was undertaken by several key associations in the off-grid sector between end-June and end-July 2020.[5] Over 600 off-grid companies, distributed over 44 countries, participated in the survey. Companies included microenterprises and multinational companies engaged in cleaning cooking, mini-grids, and distribution of household solar appliances. Key findings highlighted that over half of off-grid sector companies would face challenges in the following two months; that 85 per cent were struggling with survival for over five months; and that depressed sales were due to no demand generation, shifting consumer preferences, and logistical restrictions due to the pandemic. At the time of the EnDev survey, almost 30 per cent of firms were forced to cease their operations, either temporarily or permanently. 79 per cent of firms reported not being able to access relief financing, and only 8 per cent of firms were able to access COVID-19 relief grant funding to cover their running costs. Grant funding was highlighted among 76 per cent of firms as being a key priority to maintain operations between September-November 2020. Greater than 50 per cent of firms cited needing less than USD 50,000 to ensure their survival over 6 months, approximately one-third requiring as little as USD10,000. The results of the survey called for grant funding to complement any concessional loan financing in the pipeline.

Off-grid supplies - slow but uneven recovery in 2021.

GOGLA's Global Off-Grid Solar Market report for the second half of 2020[6] shows the off-grid industry making a slow but uneven recovery from the shock of the COVID-19 pandemic. Data from July - December 2020 revealed that globally off-grid solar lighting sales grew by 19% compared to the first half of the year, but that sales were still at the lowest level since 2015 and progress remained far from that needed to achieve universal access to electricity by 2030. From a regional perspective Sub-Saharan Africa sales in the second half of 2020 were only 4% lower than in the same period in 2019, but in South Asia, in contrast, sales remained 43% lower in the second half of 2020 compared to the same period in 2019. GOGLA estimates that the drop in sales over 2020 meant 10 – 15 million people and 300,000 – 450,000 enterprises missed out on improved energy access.

Update on short term relief efforts to ensure continuity of supply

On-grid supplies - consumers supported more than utilities

We reported in our May 2020 COVID *Energy Insight* on examples of 10 countries implementing measures to protect consumers. Many countries continue to do this, and the IMF's Policy Tracker shows that governments across over 60 countries spanning Africa, Asia, South America, Middle East, Europe and Oceania – have implemented measures to provide relief mainly to consumers and firms in the form of energy, utility and electricity payment subsidies, reductions and in suspensions.[7]

The IFC has reported[8] on just under 100 measures adopted by governments across 67 countries to provide relief to consumers on utility bills[9] (see Figure 3). For consumers measures included bill deferment (33%), reduction (35%) or total waiver (25%). An example of this is Benin, where support to the most vulnerable with electricity payment subsidies lies in the region of 0.2 per cent of GDP.

[5] EnDev, AMDA, ARE, AshDen, the Clean Cooking Alliance, Efficiency for Access, ESMAP, GDC, GOGLA and SE For All

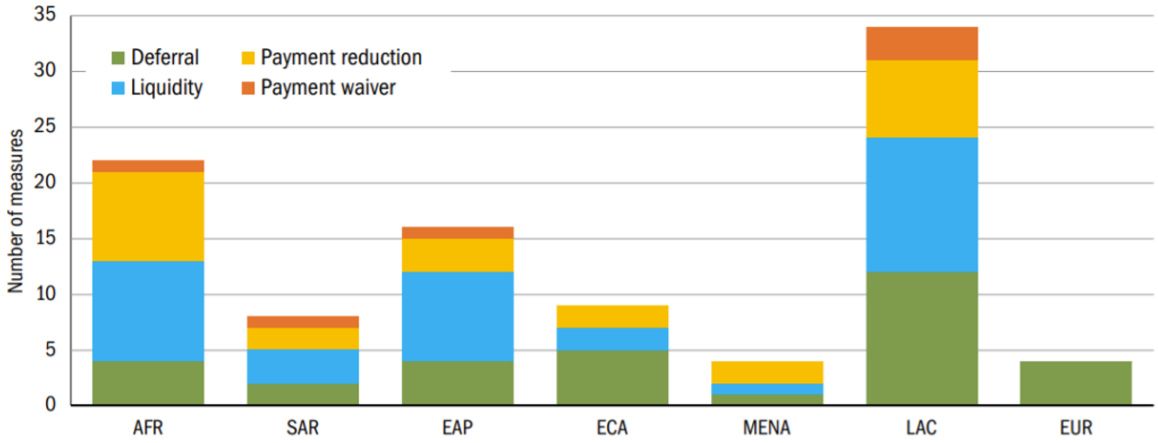
[6] https://www.gogla.org/global-off-grid-solar-market-report

[7] https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#G (Last update: 23 June 2021). Keywords included in this search were "electricity", "energy" and "utility", bearing in mind that the latter may also include payment relief on water bills as well as electricity.

[8] https://www.ifc.org/wps/wcm/connect/d198ce33-4b5a-4538-9c5a-c7259769057d/EMCompass_Note_90-web.pdf?MOD=AJPERES&CVID=nj05eVj

[9] Largely electricity utility bills, but water, gas, telecom, sanitation and cable TV utilities were also present in the sample.

Figure 3: Number of relief measures in sample of 67 countries by region[14] (Source IFC Lessons from Electric Utilities from COVID 19. Responses in Emerging Markets. Sept 2020.

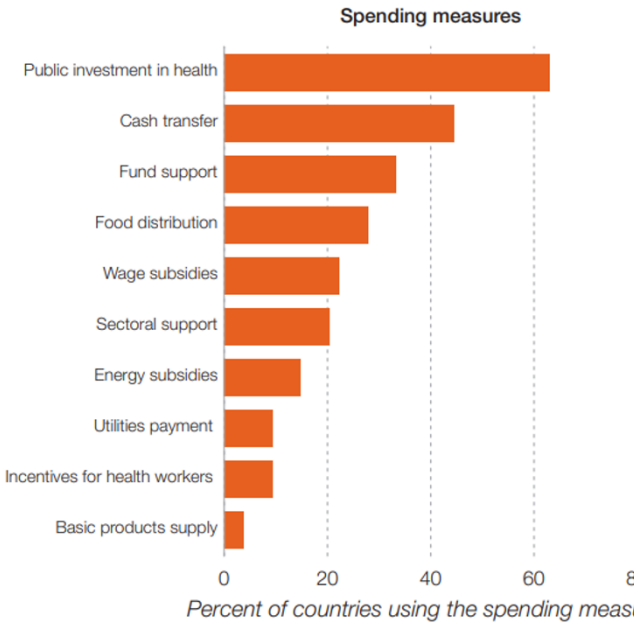


The IFC does not see government financing to targeted consumer tariff relief as a significant help to offsetting the liquidity problems for most utilities, arising from fixed costs but depressed revenue. It cites Peru as an example, where a large scale cash transfer programme to ensure a basic level of electricity supply for poor households only covers 11% of total demand and so is unlikely to make much of a dent in utility liquidity problems overall. Only 8 out of the 67 countries surveyed were found to be providing support directed at easing utility liquidity. One of the few examples of utility companies receiving direct support mentioned in the IMF Policy Tracker as of the end of June 2021 is in India, where measures were taken in

October and November 2020 to provide credit support to distressed electricity distribution companies, amounting to 0.4 per cent of GDP. These support measures have continued to be provided throughout the most recent surge in infections in May and June 2021[10].

All told, the fiscal support provided to African economies through energy and utility subsidies is relatively low compared to other measures such as public health, cash transfers and food distribution (see Figure 4).

Figure 4: Fiscal measures of African Governments



Source: African Development Bank African Economic Outlook 2021

Off-grid supplies - promises made but cash yet to materialise

Beyond a wealth of co-ordination meetings and technical assistance initiatives little in the way of emergency relief funding for the off-grid sector seems to have materialised in the past 12 months, despite a plea from industry associations at the end of May 2020 for USD 35 million of emergency grant funding for smaller decentralised renewable energy (DRE) companies.[11]

We highlighted in our *Energy Insight* last year that discussions were in progress around financing energy access providers through the COVID-19 Energy Access Relief Fund (EARF). Conceived in March 2020, the EARF was

[10] See footnote 13

[11] https://docs.google.com/document/d/1DrcvcKZ2ntb4ohOExP1YADBGfkszOXDk6Cd0HGKu9B8/edit

designed to be a EUR100 million pool of targeted concessionary debt, originally due to be launched in June 2020, to enable off-grid energy companies in Sub-Saharan Africa and Asia to both maintain their customers' existing energy services and retain the staff required to deliver future services to these customers. In November 2020, Social Investment Management and Advisors (SIMA Funds) was confirmed as the sole Fund Manager of the EARF[12] and the fund was expected to target small-to-medium sized energy access firms, focusing on loans in the range of USD 100,000-2.5 million. However, at the time of writing and over a year after its initial conception, it appears that the fund is yet to be established, with SIMA Funds' website saying "*SIMA (the Fund Manager) and the prospective Energy Access Relief Fund (EARF) investors are working hard to successfully launch the Fund; however, there is some uncertainty that still exists as to whether or not the Fund will close at any size, on any timing or at all*"[13].

Elsewhere, the African Development Bank (AfDB) in December 2020 authorised USD 20 million concessional investment from the Sustainable Energy Fund for Africa for the establishment of the COVID-19 Off-Grid Recovery Platform (CRP) to support energy access companies. [14] The CRP would be a 5-year USD 50 million blended finance platform. [15] Again, however to date, there is no publicly available information to suggest that disbursements have taken place.

Evidence of the COVID-19 pandemic stimulating strategic responses to improve the long-term resilience of power systems or accelerate the energy transition.

Little evidence of the pandemic spurring new strategic investments

The COVID-19 pandemic has exposed the vulnerability of the power sector to external crises, highlighting not just the unsustainability of utilities' finances but also the challenges of operating power systems when demand falls outside of expected ranges, when the labour force is depleted and its movements restricted, and when global supply chains are under pressure. In our May 2020 *Energy Insight* we anticipated that this experience might stimulate more strategic responses to improving the long-term resilience of power systems to external shocks, whether that be from future pandemics or other stressors such as climate change. We also noted a number of donors highlighting the importance of looking to the post-COVID crisis period to ensure that stimulus packages being granted to recipient countries support the low carbon energy transition and the green economy.

In reality, whilst it is possible to find research documenting how power systems have coped with the current crisis[16], with the exception of funding to power health facilities (see below) it is very difficult in practice to find clear evidence of a response to the COVID -19 pandemic specifically leading to any new funding for building energy systems resilience or supporting the energy transition. An example of this uncertainty would be the World Bank's ESMAP business plan for 2021-24, which includes an Energy Transition Pillar (USD 0.2 billion) that is envisaged to inform country-level post COVID-19 recovery in terms of: 1) creation of clean energy jobs, by shifting towards renewable energy and a zero-carbon sector; 2) enhanced fiscal space by reforming fossil fuel and power subsidies and greater investments in renewable energy; 3) reliable, affordable and resilient electricity supply, including support to enhance utility performance and decentralise generation. Given the energy transition would have been a pre-requisite of ESMAP's plans anyway, it is not possible to know therefore if this actually represents new money in response to COVID or just a relabelling of activity that would have happened anyway.

The exception – new off-grid investments in powering healthcare

The lack of reliable energy supply in the healthcare sector throughout Sub-Saharan Africa serves to further exacerbate vulnerability to COVID-19, and responding to the pandemic requires fully-functional healthcare equipment, vaccine refrigeration and record-keeping. IRENA's 2020 Tracking SDG7 report highlights the

[12] https://www.lightingglobal.org/news/energy-access-relief-fund-update/

[13] https://simafunds.com/fund-management/earf/ (see website's FAQ 1)

[14] https://www.afdb.org/en/news-and-events/press-releases/african-development-bank-launches-50-million-facility-support-energy-access-companies-through-and-beyond-covid-19-pandemic-39746

[15] https://www.afdb.org/en/documents/multinational-covid-19-grid-recovery-platform-project-summary-note

[16] An example would be EEG's own work looking at how regional interconnections and careful coordination helped India, Bangladesh, Nepal and Bhutan keep the power flowing throughout the crisis – see: https://energyeconomicgrowth.org/publication/learning-covid-19-experience-framework-resilient-regional-electricity-grid-bangladesh

hundreds of millions of people globally who lack adequately-powered healthcare facilities.[17] Shen and Ayele (2020) cite a WHO-led study of 11 countries in Sub-Saharan Africa that finds, on average, one in four health facilities with no access to electricity, and only 28% of health facilities and 34% of hospitals with reliable electricity supply. This does seem to be one area in the power sector where the COVID-19 pandemic has stimulated some action that goes beyond emergency response to longer term strategic action (to make health facilities more resilient and better able to respond to this sort of shock) albeit, as shown below, more in the off-grid than on-grid sector.

It is difficult to find references to specific actions taken in the last year to strengthen grid supplies to key health facilities involved in the COVID-19 response, although some initiatives are responding to the problem of grid unreliability with investments in (off-grid) back up supplies. This is perhaps understandable as grid investments tend to have widespread impacts rather than being focussed on individual sectors or facilities.

Our first COVID-19 *Energy Insight* detailed the work of SE4All and CLASP in collaboration with a group including the World Bank, AfDB and the Clinton Health Access Initiative to mobilise off-grid companies, particularly mini-grids, to power health facilities. Since then progress has been as follows:

- In March 2021, **SE4All and Power Africa and USAID** announced a USD 1 million grant for a two-year programme to provide African governments and the donor community the necessary technical assistance, knowledge exchange and thought leadership needed to expedite national health facility electrification efforts.[18] SE4All will work closely with World Bank, AfDB, WHO, UNDP, Gavi, the Rockefeller Foundation and USAID on this initiative. SE4All's COVID-19 response has also involved information provision. Of note is its ongoing work on Powering Healthcare, where it compiles resources and news on energy demand, and system design, planning and implementation that support collaboration between energy and healthcare sectors[19] and a catalogue of 'solutions providers' to help meet the energy needs of healthcare facilities in response to COVID[20].

- **Power Africa** in September 2020, announced USD 2.6 million of grant funding to solar energy companies to support electrification of almost 300 healthcare facilities across nine Sub-Saharan African countries (Nigeria, Togo, Zambia, Madagascar, Rwanda, Lesotho, Ghana, Mozambique and Malawi).[21]

- The World Bank's Energy Sector Management and Assistance Programme (ESMAP)'s Business Plan for 2021-2024 has set aside USD100 million (out of a USD 1.3 billion budget) for the COVID-19 response, in order to electrify health facilities using renewable energy solutions (so most likely off-grid installations).[22] In collaboration with other development partners, the ESMAP established a co-financing facility to help low-income and fragile countries urgently needing electrified healthcare facilities. ESMAP's Global Facility on Mini-Grids and the Global Electrification Platform programmes accompanied this effort by conducting an energy needs assessment for healthcare facilities.[23] ESMAP has, as of April 2021, initiated the mobilization of donor grant funding in excess of USD 20 million to support projects in Haiti, Liberia and Afghanistan, with other projects to come.[24]
  In June 2020, ESMAP launched the Hybrid Optimization Model for Multiple Energy Resources (HOMER) Powering Health Tool, building on previous work undertaken by the USAID Powering Health programme.[25] The tool was designed to help size distributed generation systems to meet a facility's needs and calculates least-cost combinations of battery, PV and diesel generator power required to

[17] https://irena.org/publications/2020/May/Tracking-SDG7-The-Energy-Progress-Report-2020
[18] https://www.seforall.org/news/health-facility-electrification-in-sub-saharan-africa
[19] https://www.seforall.org/energy-and-health/powering-healthcare-resources
[20] https://www.seforall.org/data-stories/powering-healthcare-solutions-catalogue
[21] https://powerafrica.medium.com/usaid-power-africa-announces-2-6-c003fa75f004
[22] https://esmap.org/sites/default/files/esmap-files/ESMAP%20Business%20Plan%20FY21-24%20Overview_0.pdf
[23] https://www.esmap.org/energy-sector-management-assistance-program-%28esmap%29-annual-
[24] https://blogs.worldbank.org/climatechange/covid-19-vaccines-saving-lives-and-rebuilding-better
[25] https://www.esmap.org/launching-the-homer_powering_health_tool

power various combinations of medical equipment, including those used to screen, test and treat COVID-19 patients. The tool can be applied to four tiers of healthcare facility, ranging from small, rural dispensaries through to district hospitals, for example. The HOMER tool is currently being applied in Sri Lanka to help the country pursue new power solution to 20 hospitals[26] and, together with other more advanced tools, the technology is also being applied in Afghanistan, Madagascar and Nigeria. [27]

ESMAP has also produced a COVID-19 Emergency Power Supply Response Strategy Note[28] aimed at helping World Bank teams to restructure IBRD/IDA lending activities to ensure reliable energy supply for critical health facilities. Currently in draft form this note includes guidance on power audits to assess the need for back up generators or solar / battery combinations for health facilities with unreliable grid connections.

- The **World Bank** asserts that the priority at present is to ensure reliable and effective cold chains in order to ensure successful COVID-19 vaccine deployment, and that reliable energy is key to achieving this.[29] Examples of World Bank support in this area include in Ghana where the it has been supporting the governmental health facility refurbishment, including installing off-grid solar in rural and peri-urban health facilities to enhance resilience of vaccine deployment; in El Salvador where World Bank is exploring how to build resilience and limit energy needs for cooling, especially when grid electricity access may be limited; in Mongolia where World Bank and UNICEF are funding the construction of a new central vaccine storage facility that incorporates energy-efficient building designs and cold rooms; and in Somalia, where the focus is on ensuring energy efficient vaccine storage and the installation of distributed solar power.

Cause for concern - relabelling and fund switching

Although the above investments are to be welcomed there is a need for some caution considering all new announcements of investment in powering the health sector as 'new' money. It is not always possible to discern whether investments were already planned pre-pandemic and are just being relabelled or are genuinely new additional funding. There are also (more alarming) examples of existing funding for energy being transferred to COVID-related investments at the expense of other areas of health. One of these can be found on the Green Climate Fund's website where it notes "*in Honduras, CIF facilitated the restructuring of a clean cook stove project to direct finance towards the deployment of solar-powered mobile health units which have helped alleviate pressure on the country's hospitals*[30]" thus depriving a clean energy project aimed at improving respiratory health through reducing indoor air pollution to fund a clean energy project aimed at supporting a health response to COVID.

Concluding remarks

Our findings suggest that both the on-grid and off-grid sectors continue to be impacted by the COVID 19 pandemic in 2021. Within the on-grid sector, some multilateral organisations may be considering COVID-19 related support to the energy sector in their long-term business plans. However, the more immediate response has been at the country level, where governments have adopted fiscal measures to support consumers and, to a much lesser extent, utilities. In terms of the off-grid sector, initial optimism around efforts to help ensure smaller energy access companies would be supported throughout the pandemic have proven unfounded, with little material relief to date. With the exception of new investments in power supplies for health facilities, it remains unclear as to whether the pandemic will galvanise new additional investment to make power sectors more resilient to external shocks or to speed up the energy transition.

[26] https://esmap.org/multimedia/renewable-energy-health-care-sri-lanka-during-covid-19-and-beyond?resources
[27] https://blogs.worldbank.org/energy/renewable-energy-health-care-sri-lanka-during-covid-19-and-beyond
[28] https://www.seforall.org/system/files/2020-04/COVID19-emergency%20power-supply%20strategy-note.pdf (draft for consultation as at 22nd June 2021).
[29] https://blogs.worldbank.org/climatechange/covid-19-vaccines-saving-lives-and-rebuilding-better
[30] https://www.greenclimate.fund/statement/supporting-developing-countries-road-climate-resilient-recovery-covid-19-pandemic

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The views expressed in this Energy Insight do not necessarily reflect the UK government's official policies.