WORLD BANK GROUP

Supported by ESMAP
Energy Sector Management Assistance Program

Live Wire

A KNOWLEDGE NOTE SERIES FOR THE ENERGY & EXTRACTIVES GLOBAL PRACTICE

2022/121

Access to Clean Cooking and Electricity: Righting the Policy Balance in Sub-Saharan Africa and Fragile Settings

THE BOTTOM LINE

ESMAP's Regulatory Indicators for Sustainable Energy (RISE; ESMAP 2020a) capture the status of national policy and regulatory frameworks for sustainable energy, assessing support for access to electricity, access to clean cooking fuels and technologies, energy efficiency, and renewable energy. This Live Wire analyzes data from the 2020 edition of RISE and presents the trends in policy on access to clean cooking and electricity, with a focus on Sub-Saharan Africa and the countries within the region affected by fragility, conflict, and violence. The imbalance in policy effort on the two forms of access is explored.

Sharmila Bellur is a consultant in sustainable energy at the Energy Sector Management Assistance Program (ESMAP) at the World Bank.

Paul Mathew is a consultant at ESMAP.

Juliette Besnard is an energy specialist at ESMAP.

What is the status of global progress toward universal access to electricity and clean cooking solutions?

In 2019, 759 million of the world's people still lacked access to electricity; the figure for access to clean cooking was 2.6 billion

Goal 7.1 of the Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 calls for universal access to electricity and to clean cooking fuels and technologies by 2030. Electricity access has progressed farther and faster than access to clean cooking, but even here the momentum has stalled in recent years. In 2019, 759 million of the world's people still lacked access to electric power. The access deficit is concentrated in Sub-Saharan Africa, where 570 million people were still without access to electricity. Nearly half of the unserved Africans lived in countries affected by fragility, conflict, and violence (FCV).

The picture for clean cooking is worse. In 2019, 2.6 billion people—a third of the earth's people—lacked access to clean cooking fuels and technologies. In Sub-Saharan Africa, the share is much higher: 84%, or 894 million people. About half of them live in FCV countries.

Clean cooking lags electrification in almost every country (IEA et al. 2021), and policies to promote access to electricity are much stronger and better funded than those to promote access to clean cooking (ESMAP 2020a). In 2019, USD 12.87 billion was spent to fund electrification, compared with USD 133.5 million for clean cooking (SE4All 2021). The scale of capital deployed to extend electrical grids in rural areas, as well as to improve electricity networks in dense city environments, has dwarfed investment in cooking programs (ESMAP 2020b).

Box 1. RISE's traffic-light rating system to score the policy environment

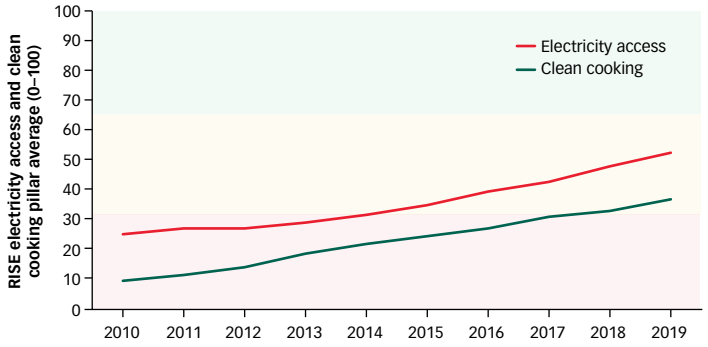
- Green zone countries have scores between 67 and 100. Most elements of a strong policy framework for sustainable energy are in place.
- Yellow zone countries score between 34 and 66. Significant opportunities remain to strengthen the policy framework.
- Red zone countries have scores below 33. Few or no elements of a supportive policy framework have been enacted.

ESMAP's Regulatory Indicators for Sustainable Energy (ESMAP 2020a) capture the status of national policy and regulatory frameworks for sustainable energy, assessing support for access to electricity, access to clean cooking fuels and technologies, energy efficiency, and renewable energy. This Live Wire analyzes data from the 2020 edition of RISE and presents the trends in policy on access to electricity and clean cooking. The RISE rating system is summarized in box 1. Of the world's countries, 54 had a significant deficit in access to electricity in 2019; 55 had a significant deficit in access to clean cooking. Yet the average country score for policy performance on the two types of access showed a marked disparity: 37 for policies on clean cooking; 53 on electricity (figure 1).

2.6 billion people—a third of the earth's people—lack access to clean cooking fuels and technologies.

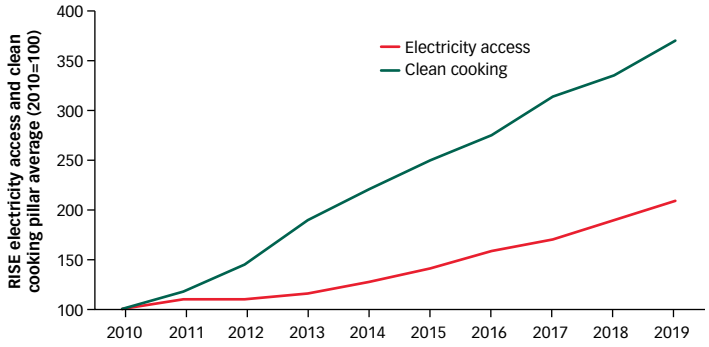
Figure 1. RISE scores: Electricity access v. clean cooking, 2010–19

RISE zones shown in pale green, yellow, and red horizontal bands



Source: ESMAP 2020a.

Figure 2. Indexed growth of RISE scores: Electricity access v. clean cooking, 2010–19



Source: ESMAP 2020a.

In short, policies on clean cooking have lagged those on electricity access around the world. Policy progress on electrification is fueled by integrated approaches based on data-driven, least-cost planning. Meanwhile, the policy apparatus for clean cooking has few monetary and fiscal initiatives to spur sector growth. The dearth of funding is compounded by the many cross-sectoral aspects of clean cooking policy—energy, health, environment, climate, and gender. Without a champion and lacking intersectoral coordination, clean cooking has often been unable to gain traction.

Yet since 2010 the clean cooking frameworks have grown faster than those for electrification, albeit from a much lower base. Average RISE scores for clean cooking in 2019 were 3.5 times those recorded in 2010 (figure 2). In 2019 only 15 percent of the countries with access deficits had advanced policy frameworks. Those countries, which include Ethiopia, India, Indonesia, and Kenya, represent more than half the world's unserved population. Still, between 2010 to 2019 the number of people lacking access to clean cooking fuels and technologies dropped by just 9 percent—from 3.0 billion to 2.6 billion. Policy frameworks for electricity access have more than doubled their scores since 2010, despite growing at a slower rate overall than those for clean cooking. By 2019 more than a quarter of the electricity-access-deficit countries had mature policy structures—among them Bangladesh, South Africa, and Tanzania.

Those countries lacking universal access to clean cooking (55 countries) and electricity (54 countries) reveal scant correlation between policy preparedness for clean cooking and for electrification (figure 3). Perhaps electricity access has remained a priority across nations because lack of access is seen worldwide to slow economic development, endanger public health and safety, and hold back social development, whereas access to clean cooking is not viewed with the same sense of urgency. It may be that, to expand, access to clean cooking will require stronger political commitment, longer-term planning, more private financing, and suitable incentives (IEA et al. 2021).

In 13 of the 54 electricity-access-deficit countries, policy making for clean cooking has caught up to or overtaken that for electricity access, according to the RISE 2020 results (figure 4). Of these, eight are in Sub-Saharan Africa.

Planning that incorporates both electrification and clean cooking priorities can help mainstream solutions and avoid large

When cooking solutions are integrated into large development investments (urban and rural) and broad energy policy, clean cooking diffuses at a more rapid rate, moving the needle on universal access.

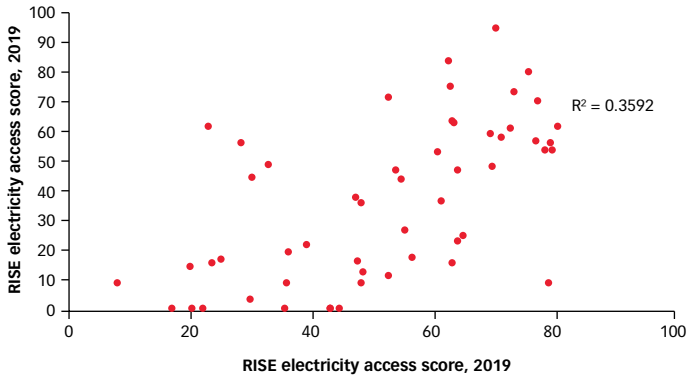
discrepancies in progress toward the two access pillars. When cooking solutions are integrated into large development investments (urban and rural) and broad energy policy, clean cooking diffuses at a more rapid rate, moving the needle on universal access.

What is the status of access policy in Sub-Saharan Africa?

Policy performance across the continent is uneven—but good performers show a path forward

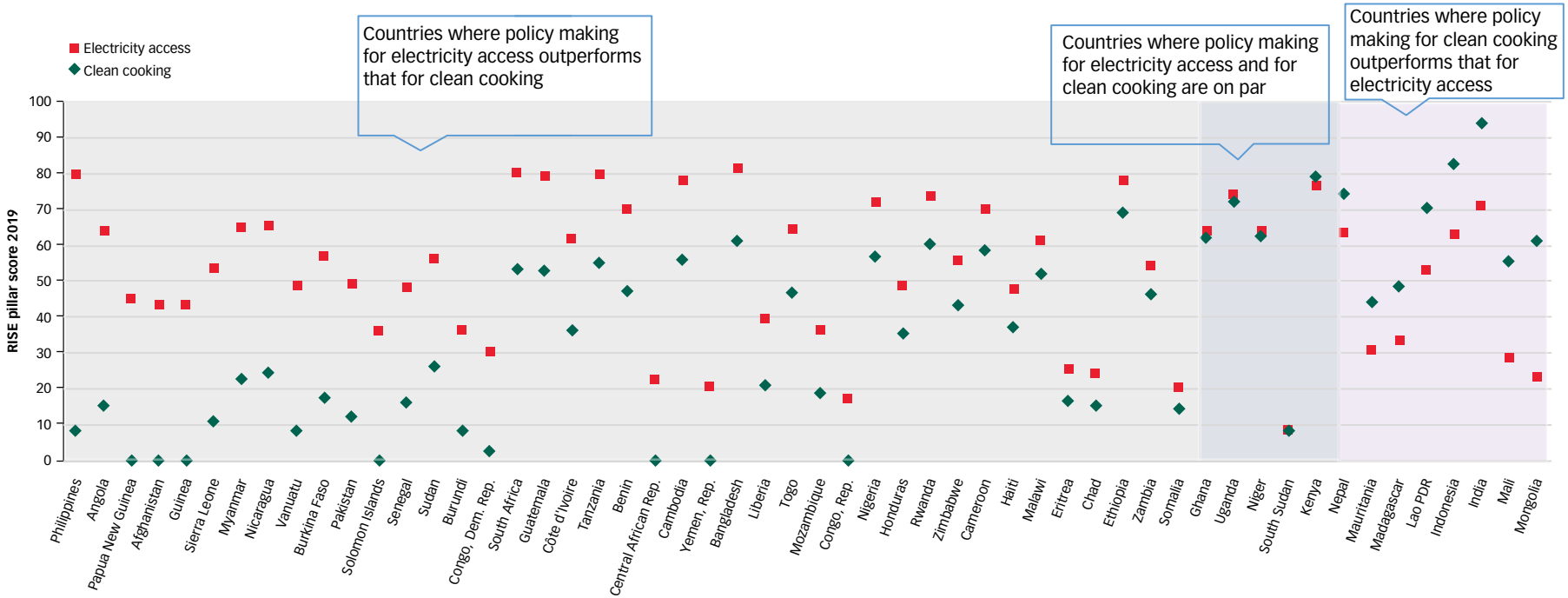
Sub-Saharan Africa contains 35 of the world's access-deficit countries. With a regional average score of 35 on the RISE clean cooking index, the region has the lowest regional average in the world. One in three of the region's countries are in the RISE red

Figure 3. Correlation between RISE scores at the country level: Electricity access and clean cooking, 2019



Source: ESMAP 2020a.

Figure 4. RISE scores: Electricity access vs. clean cooking, 2019



Source: ESMAP 2020a.

For progress on clean cooking policy since 2010, look to Kenya, Mali, Nigeria, Rwanda, and Tanzania; since 2017 the latter three have implemented policies to expand access.

zone, and many have yet to adopt policies on clean cooking, such as planning documents and policies to raise awareness, collect data, and strengthen institutional capacity. The 16 Sub-Saharan countries in the RISE yellow zone have moderately well developed policy frameworks. Having established the necessary policies, countries in the yellow zone turn to last-mile strategies and monetary policies to boost uptake, deploying financing mechanisms for consumers and financial incentives to suppliers. Incremental policy additions in the region's three green zone countries (Ethiopia, Kenya, and Uganda) include efficient clean cooking solutions, emissions standards, and infrastructure to test those standards.

For the 2020 RISE index on electricity access, Sub-Saharan African countries had an average score of 51, trailing other developing regions such as East Asia and the Pacific (55), Latin America and the Caribbean (60), and South Asia (62).[1]

More than a quarter of the Sub-Saharan African countries have remained in the red zone, displaying few policies on electricity access. About half are in the yellow zone, having passed some regulations to improve public access to electricity. This group tends to perform well on frameworks for grid electrification, consumer affordability of electricity, and utility transparency and monitoring. Of the remaining quarter of Sub-Saharan countries that have risen to the green zone, Ethiopia and South Africa have the most advanced policies on electricity access; these are focused on improving the scope of access for all segments of society using decentralized energy sources and promoting consumer affordability.

Since 2010, Nigeria and Rwanda have made the most progress on national regulations on electricity access, apparently because of a range of policy improvements in planning, consumer affordability, utility transparency and monitoring, and better frameworks for mini-grids and standalone systems. Since 2017, Ethiopia and Kenya have made notable improvements in their national frameworks to boost electricity access by working on affordable access, strong planning, and decentralized energy policies (figure 5).

For progress on clean cooking policy since 2010, look to Kenya, Mali, Nigeria, Rwanda, and Tanzania; since 2017 the latter three have implemented policies to expand access (figure 5). Now gaining momentum in these countries, these policies are bolstering institutional capacity by assigning clean cooking responsibilities to government agencies. In addition, the policies provide financial incentives to suppliers and financing mechanisms for purchasers of clean cooking solutions. Awareness-raising and last-mile distribution strategies are also gaining popularity among the countries that are improving their scores on the RISE index.

Of the three subregions of Sub-Saharan Africa with substantial coverage in RISE (East Africa, West Africa, and Central Africa[2]) the best performer on the RISE clean cooking index is East Africa, with an average score of 48; West Africa follows (37), trailed by Central Africa (21).

East Africa, the regional exemplar, displays the entire spectrum of clean cooking practice. At one end, it is home to the top regional performers (Ethiopia, Kenya, and Uganda), but it includes laggards Burundi, Somalia, and South Sudan, which have yet to institute any clean cooking policies. In the middle are Malawi, Rwanda, and Tanzania, which have meaningful clean cooking policies on planning, awareness, last-mile distribution, and financial incentives. But they have yet to establish standards and labeling.

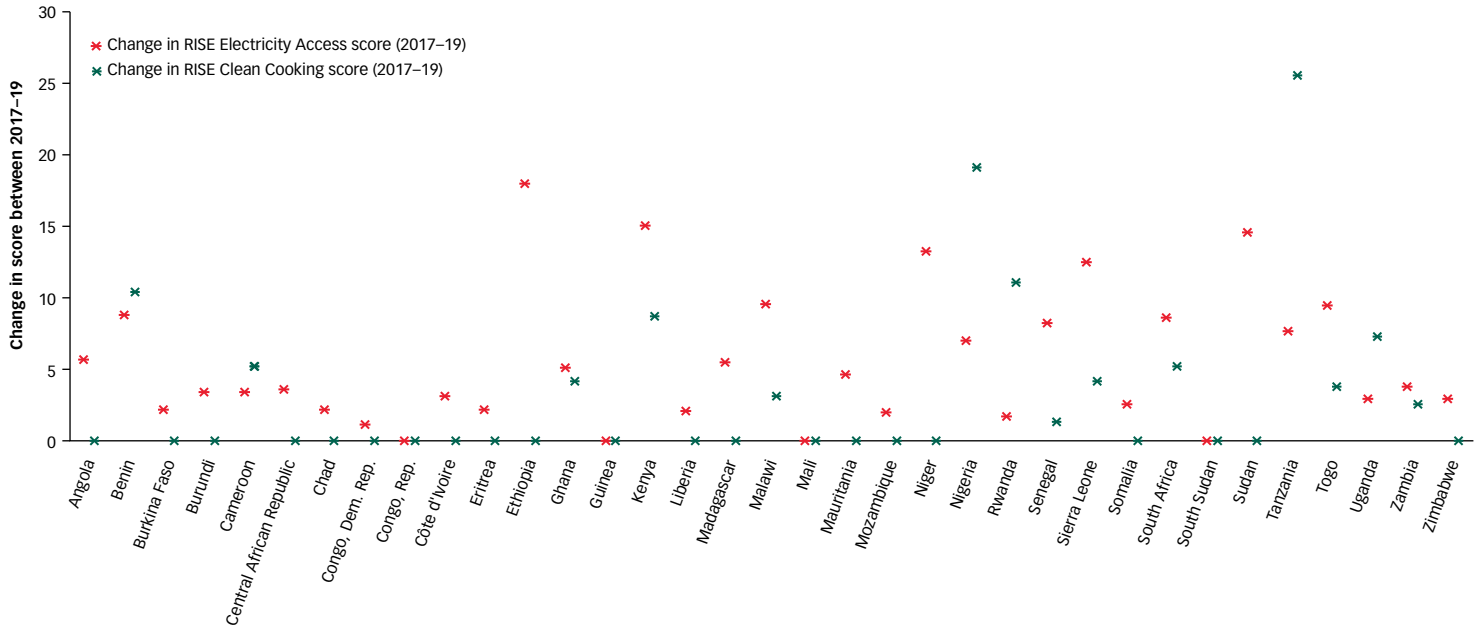
West African countries, except for Guinea, have all launched some clean cooking policies. Although the region has no countries in RISE's green zone, most West African countries have plans to scale up access to clean cooking (including Burkina Faso, Sierra Leone, and Senegal, all in the RISE red zone) and some institutional capacity to support the clean cooking agenda. Other policies commonly found in the region are awareness campaigns, financing mechanisms for end users, and financial incentives for suppliers.

In Central Africa, plans to scale up access to clean cooking and engage in awareness strategies to drive adoption are among the emerging policy actions. But fragility and conflict affect countries throughout Central Africa (except for Angola), deterring policies and regulations from taking root.

1. The Middle East and North Africa is not covered by the 2020 RISE index because only one country in the region (Yemen) participates in RISE.

2. Of the countries in Southern Africa, only South Africa is covered in RISE. East Africa comprises Burundi, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Somalia, South Sudan, Tanzania, Uganda, Zambia, and Zimbabwe; for the purpose of this analysis, South Africa has been grouped with East Africa. West Africa includes Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Central Africa includes Angola, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, and Congo Republic; for the purpose of this analysis, Sudan is grouped with Central Africa.

Figure 5. Annual change in RISE scores on access to clean cooking and electricity indices, 2017–19



Source: ESMAP 2020a.

In 2010 East Africa had the most advanced policy frameworks on electricity access in Sub-Saharan Africa. But West Africa has since overtaken it, becoming the most advanced subregion, with an average score of 54 in 2019.

In 2010 East Africa also had the most advanced policy frameworks on electricity access in Sub-Saharan Africa. But West Africa has since overtaken it, becoming the most advanced subregion, with an average score of 54 in 2019. East Africa (53) is close on its heels, but Central Africa (41) lags, with much weaker policies.

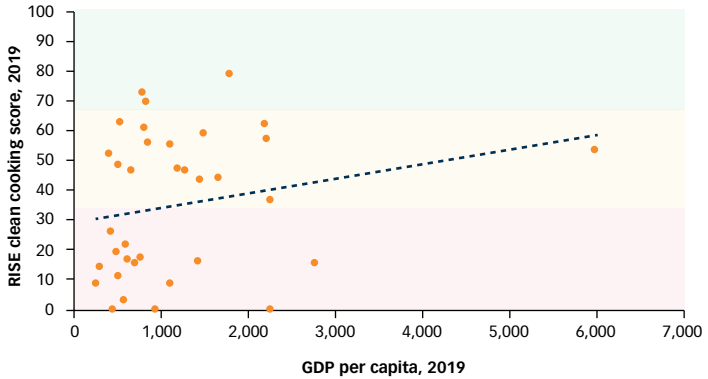
Within West Africa, most of the region's countries are in the yellow zone, having moderately good policies and structures in place for electricity access. The remaining countries are split evenly between the red and green zones, with Benin, Nigeria, and Togo leading the region. Their advanced regulatory moves on electricity access are improving consumer affordability and frameworks for mini-grids and grid electrification.

A fifth of the countries in East Africa remain in the red zone, with scanty frameworks for electricity access. About 40 percent of the countries in the subregion score in the yellow zone, with moderate regulations in place. The remainder have entered the green zone. Ethiopia, Kenya, and Uganda lead the region with strong policies that minimize access deficits, including expanded plans for national electrification, decentralized energy sources, and improved consumer affordability.

In Central Africa, more than half of the countries remain in RISE's red zone because of weak progress in their electricity access policies, with indicators such as utility transparency and monitoring dragging down the scores. About a third of the Central African countries lie in the yellow zone; they have moderately developed regulations. Cameroon is the only country in the green zone. With its well-defined electricity access public frameworks, Cameroon has made significant improvements in consumer affordability.

Figure 6. RISE clean cooking score v. GDP per capita, Sub-Saharan Africa, 2019

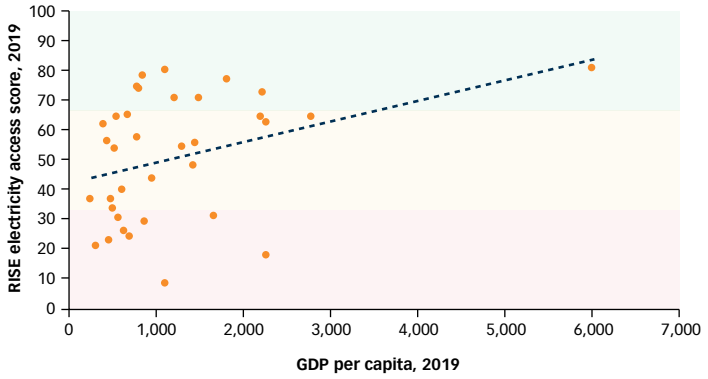
RISE zones shown in pale green, yellow, and red horizontal bands



Source: ESMAP 2020a.

Figure 7. RISE electricity access score v. GDP per capita, Sub-Saharan Africa, 2019

RISE zones shown in pale green, yellow, and red horizontal bands



Source: ESMAP 2020a.

Institutional and social instability, forced displacement, extreme poverty, and poor governance are impediments to the development and implementation of policies.

In RISE 2020, 21 of the 35 access-deficit countries in Sub-Saharan Africa were low-income countries (and 13 of the 21 fell into RISE's red zone). Only 1 of the 35 was upper-middle-income (South Africa); the remaining 13 were in the lower-middle-income group. Viewed through the lens of per capita income and bundled by income group, clear trends emerge (figure 6). Clean cooking policies in low-income Sub-Saharan African countries are at a nascent stage, with an average score of 30. Just seven of the thirty-five low-income countries are in the yellow zone; two, Ethiopia and Uganda, are in the green zone.

The lower-middle-income countries as a group have moderately well-developed clean cooking policy frameworks. The average clean cooking score of the group is 43. Nine of the thirteen lower-middle-income countries are in the yellow zone, two are in the red zone, and one (Kenya) is in the green. South Africa, the only upper-middle-income country, has a score of 53 on the RISE clean cooking index.

For electricity access, a third of low-income countries fell into the red zone, with weak and outdated electricity policies in place, and most of the rest were in the yellow zone (figure 7). Only three scored in the green zone, having strong policies in place to ensure consistent and sustained access to electricity for their populations. Those three—Ethiopia, Rwanda, and Uganda—have made enormous strides on consumer affordability, utility transparency and monitoring, and frameworks for standalone systems. Of the lower-middle-income countries, around half were in the yellow zone, while five were in the green zone and just two were red. Sub-Saharan Africa's only upper-middle-income country, South Africa, is in the green zone, with strong policies in place.

What do sustainable energy policies look like in the fragile and conflict-affected countries of Sub-Saharan Africa?

FCV countries are among the poorest performers on the RISE electricity access and clean cooking indices

Institutional and social instability, forced displacement, extreme poverty, and poor governance are impediments to the development and implementation of policies. The COVID-19 pandemic has worsened the development barriers, very probably reversing progress made over the past decade.[3]

3. The 2022 edition of RISE will provide extensive analysis of the impact of COVID-19 on clean cooking and electricity policy making.

As a group, FCV countries in Sub-Saharan Africa have been the poorest performers on the RISE clean cooking index, with an average score of 25 in 2019. Still, this is an improvement over the 2010 scores, when the average was 8.

In 2010, the electricity access frameworks in Sub-Saharan Africa's 22 FCV countries had an average score of 23, with few policies on electricity access. By 2019 the FCV countries had improved, with an average score of 41, whereas non-FCV countries maintained a 60+ average, highlighting the enduring on-the-ground costs of conflict and violence. Grid electrification policies and planning lag in FCV countries, no doubt because of the overwhelming challenges involved in setting and implementing national targets. But as seen in Cameroon and Nigeria, policies on consumer affordability, mini-grids, and standalone systems are gaining momentum. This may be because, across fragile countries, it may be easier to achieve multiple, small-scale solutions that are suited to the locales.

As a group, FCV countries in Sub-Saharan Africa have been the poorest performers on the RISE clean cooking index, with an average score of 25 in 2019. Still, this is an improvement over the 2010 scores, when the average was 8. Because many of these countries benefit from the services of external aid agencies, and because clean cooking is emerging as a policy priority, many FCV countries in Sub-Saharan Africa now track data on access, have strategies to raise awareness, and have plans to increase uptake. Some countries, including Cameroon, Mali, Niger, and Zimbabwe, have also built their institutional capacity. Conspicuously lacking among the region's FCV countries are last-mile strategies, labeling mechanisms, and standards for emissions and efficiency for clean cooking fuels and technologies.

Do some countries perform well despite their fragility, low income, and remote rural populations?

Some countries do indeed perform well despite these obstacles

Having developed robust policy frameworks, Ethiopia and Uganda, despite being low-income countries, climbed into the green zone on the RISE clean cooking index. Their policy-making progress was bolstered by data on clean cooking, which yielded numerous benefits. In addition to informing government policies, the data enabled targeting and awareness raising; opened access to finance; built the technical capacity of producers and distributors; and supported innovation in design, testing, production, marketing, and use of clean cookstoves and fuels.

Niger and Nigeria, also low-income countries, rose into the yellow zone on clean cooking policy making while coping with fragility, conflict, and violence.

Progress in fragile and low-income settings is often galvanized by international donors that support financial incentives for clean cooking providers and users.

Ethiopia, Rwanda, and Uganda have made vast improvements in their policies and regulations on electricity access, in comparison to their Sub-Saharan African and low-income peers. They have focused chiefly on rolling out strong and nationally approved electrification plans that strengthen decentralized energy sources and consumer affordability. This welcome trend proves that countries can advance the universal access agenda when they have buy-in from local and national stakeholders.

Cameroon and Nigeria have both improved their electricity access frameworks, so they remain in the green zone despite their FCV status.

What areas of access policy need bolstering in Sub-Saharan Africa?

The answer varies by level of policy development and type of access

Clean cooking must become a national priority, one designed to lower market entry costs, raise consumer awareness, eliminate financing gaps for producers, encourage innovation, and develop infrastructure for fuel production and distribution.

- Green zone countries should resist policy rollbacks in the face of COVID-19, as seen in Kenya (Clean Cooking Alliance 2021), and advance a policy framework that embraces universal access to clean cooking. They should focus on labeling schemes, policies that target women in the clean cooking supply chain, and uptake of clean cooking solutions in Tier 3 and above of the Multi-Tier Framework.[4]

4. The Multi-Tier Framework measures household access to cooking solutions, considering six technical and contextual attributes, ranging from Tier 0 (no access) to Tier 5 (full access).

MAKE FURTHER CONNECTIONS

Live Wire 2014/9. "Tracking Access to Electricity," by Sudeshna Ghosh Banerjee and Elisa Portale.

Live Wire 2014/16. "Capturing the Multi-Dimensionality of Energy Access," by Mikul Bhatia and Nicolina Angelou.

Live Wire 2014/22. "Scaling up Access to Electricity: The Case of Rwanda," by Paul Baringanire, Kabir Malik, and Sudeshna Ghosh Banerjee.

Live Wire 2014/33. "Tracking Progress Toward Sustainable Energy for All in Sub-Saharan Africa," by Elisa Portale and Joeri de Wit.

Live Wire 2015/34. "Scaling Up Access to Electricity: Pay-as-You-Go Plans in Off-Grid Energy Services," by Alejandro Moreno and Asta Bareisaite.

Live Wire 2014/35. "Planning for Electricity Access," by Debabrata Chattopadhyay, Rahul Kitchlu, and Rhonda Jordan.

Live Wire 2015/51. "Scaling Up Access to Electricity: Emerging Best Practices for Mini-Grid Regulation," by Chris Greacen, Stephanie Nsom, and Dana Rysankova.

Live Wire 2017/74. "Increasing the Use of Liquefied Petroleum Gas in Cooking in Developing Countries," by Richenda Van Leeuwen, Alexa Evans, and Besnik Hyseni.

Live Wire 2017/76. "Increasing the Potential of Concessions to Expand Rural Electrification in Sub-Saharan Africa," by Richard Hosier, Morgan Bazilian, and Tatia Lemondzhava.

Live Wire 2018/89. "Kenya's Strategy to Make Liquefied Petroleum Gas the Nation's Primary Cooking Fuel," by Inge C. van den Berg.

Live Wire 2019/106. "Planning Models for Electricity Access: Where Do We Go from Here?" by Rahul Srinivasan and Debabrata Chattopadhyay.

Live Wire 2021/113. "Tracking Advances in Access to Electricity," by Milien Dhorne, Claire Nicolas, Christopher Arderne, and Juliette Besnard.

Live Wire 2021/115. "COVID-19's Impact on the Transition to Clean Cooking Fuels: Initial Findings from a Case Study in Rural Kenya," by Yabei Zhang and Zijun Li.

Find these and the entire Live Wire archive at www.worldbank.org/energy/livewire.

- Countries in the yellow zone should target beneficiaries, strengthen last-mile distribution, set standards and labeling for clean cooking products, and adopt financing mechanisms for low-income end users. In low-income Malawi, clean cooking initiatives have gained considerable momentum. The national plan for universal access includes a last-mile distribution network, an awareness program, and a financial incentive structure.
- Finally, countries in the red zone should begin to formalize national energy planning and ensure that data are available while scaling up public and private financing for clean cooking. Rwanda's micro-finance programs, subsidies for biogas stoves and suppliers, and duty exemptions for stoves above Tier 2 are examples of policy actions that red zone countries can take.

Regarding electricity access, integrated electrification strategies and planning based on updated and comprehensive data remain critical, as they exert a strong positive influence on investment decisions. Policy frameworks and workable regulations should leverage public and private financing to fund electrification on a large scale and foster innovations in technology and business models to promote inclusive access.

The unelectrified population consists largely of people who are vulnerable, poor, and living in remote areas. Over the past decade, South Africa and Tanzania have, by focusing on planning in support of standalone systems and consumer affordability, vastly improved their electricity access frameworks. The achievements of Bangladesh and the Philippines in expanding their electrification plans, improving support for mini-grids, and promoting transparency and monitoring of utilities could be reproduced in comparable Sub-Saharan African countries, given political commitment and international support.

Countries in the yellow zone should focus on maintaining and improving their policy frameworks to sustain the pace of electrification and mitigate the adverse impacts of the pandemic on national utilities, mini-grids, and off-grid solar systems.

References

Clean Cooking Alliance. 2021. *Clean Cooking Industry Snapsho*t. Washington, DC. https://www.cleancookingalliance.org/binary-data/RESOURCE/file/000/000/620-1.pdf

IEA, IRENA, UNSD, World Bank, WHO. 2021. *Tracking SDG 7: The Energy Progress Report*. World Bank, Washington, DC. https://trackingsdg7.esmap.org/downloads.

ESMAP (Energy Sector Management Assistance Program). 2020a. *Regulatory Indicators for Sustainable Energy (RISE): Sustaining the Momentum*. Washington, DC: World Bank. https://rise.esmap.org/reports.

ESMAP. 2020b. *The State of Access to Modern Energy Cooking Services.* Washington, DC: World Bank. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/937141600195758792/the-state-of-access-to-modern-energy-cooking-services

SE4All (Sustainable Energy for All). 2021. *Energizing Finance: Understanding the Landscape*. Washington, D.C., and New York. Energizing Finance Research Series, https://www.seforall.org/energy-finance.

The team is grateful to Elisa Portale for her guidance and Alisha Pinto and Raluca Golumbeanu for their feedback as peer reviewers.