7 AFFORDABLE AND CLEAN ENERGY

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# Affordable clean energy through DIGITAL FINANCIAL INCLUSION

**Around 770 million people had no access to electricity in 2020,[1] with more than 60% of them (479 million people) living in the least-developed countries.[2] Globally, around 2.4 billion people still use solid fuels to cook.[3] Women and children, who spend more time closer to domestic hearths, have higher exposure risks.[4]**

## OPPORTUNITY

**Digital payments and loans offer flexible, remote, and secure payment solutions for energy services for millions of people with prepaid metering solutions—not only for pay-as-you-go but also in the mini-grid[5] sector.[6,7] An estimated 27 million customers have access to energy through PayGo[8] systems.[9]**

## CHALLENGES

- The negative impact of COVID-19 on household incomes made basic energy services less affordable. An estimated **90 million people in Africa and Asia lost access to basic energy services during the pandemic**.[10]
- **Four out of five people in sub-Saharan Africa have no access to electricity**, a problem exacerbated by the pandemic.[12]
- **Girls and women in low-income households are disproportionately affected by energy poverty**. Women devote more time and effort than men to collecting and preparing wood and other household fuels, and are more susceptible to indoor air pollution, as they spend more time on housework. This also leaves them less time for productive activities.[14]

## SOLUTIONS

- Digital payments are **cost-effective**, and models such as smart meters and pay-as-you-go combine digital bill payments and prepaid energy to lower the cost of energy access.[11]
- PayGo solar is enabling households to pay system costs over a longer time, providing **affordable solar power to over 8 million people in sub-Saharan Africa** between 2013 and 2018.[13]
- **Digital financial services enable customers to build transaction histories,** helping providers to underwrite loans and increase women's access to finance and basic services.[15]

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## RWANDA

Launched in December 2016, the Instant Payment Notification hub—which connects multiple PayGo utility providers and mobile money providers—has processed notifications for over 1.5 million unique payment transactions. The hub has enabled clean energy access for up to 100,000 households and **cut the time taken to supply energy to customers, from over 2 hours to 3 minutes.**[16]

## PAKISTAN, MALAWI AND OTHERS[17]

Angaza, a technology platform based on the PayGo model, has assisted over 5 million consumers in emerging markets to save over $100 million (as of 2020), by aiding their transition from kerosene to clean, renewable energy.[18]

## TANZANIA

Access to PayGo solar lamps **increased the likelihood of a rural woman working outside the household by five percentage points.** This led to 40 minutes more paid work and 24 minutes more unpaid work per day.[19,20]

## GHANA AND OTHERS[21]

As of March 2017, the Azuri PayGo solar home system provided 46.8 million hours of clean light and 15.3 million hours of mobile phone charging, avoiding 5,668 tonnes of $CO_2$ emissions.[22] According to surveys, the average customer saves up to $70 in the first year. Thirty-seven percent of Azuri customers spent their savings on school fees, 28% spent them on food and water, and 20% reinvested the money in their business.[23]

## CÔTE D'IVOIRE, GHANA, MALI AND SENEGAL

Reaching 700,000 people with its solar devices, PEG Africa helps customers to establish credit ratings and gain access to loans. In 2020, the sales from hundreds of pump installations surpassed $1 million.[24]

## WORLDWIDE

There are 1.2 billion registered mobile money accounts[25] enabling new business models for affordable and clean energy companies. As of 2021, 30 million people are benefiting from a PayGo affordable modern energy products and services.[26]

**1.** IEA, 2022. **2.** IEA et al., 2021. **3.** WHO, 2022. **4.** Whiting, 2021. **5.** According to Energypedia, mini-grids are a set of electricity generators and possibly energy storage systems interconnected to a distribution network that supplies electricity to a localized group of customers. **6.** Waldron et al., 2018. **7.** Tellez et al., 2019. **8.** Pay-as-you-go (PayGo) is a system where costs are met as they arise, or services are paid for before they are used. New business models are emerging where mobile payments or other forms of digital payment are used to facilitate payment processing. **9.** Faz, Khaki and Mattern, 2021. **10.** United Nations, 2022. **11.** Waldron et al., 2018. **12.** Cozzi, Tonolo, and Wetzel, 2021. **13.** IRENA, 2020. **14.** Kumaraswamy, 2021. **15.** Ibid. **16.** GSMA, 2018. **17.** India, Kenya, Nicaragua, Sierra Leone, South Africa and Uganda **18.** IRENA, 2020. **19.** Aevarsdottir, Barton, and Bold, 2017. **20.** Kumaraswamy, 2021. **21.** Ethiopia, Kenya, Malawi, Rwanda, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zimbabwe **22.** UNFCCC, 2017. **23.** UNFCCC, no date. **24.** Jackson, 2021. **25.** GSMA, 2021. **26.** GOGLA, 2021.

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