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Unlocking Climate Finance to Accelerate Energy Access in Ethiopia

November 2, 2021

Developed in partnership with:

Shell Foundation

The Rockefeller Foundation

Sustainable Energy for All

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Research Context

This research is part of a series of reports from Catalyst Off-Grid Advisors and partners

They demonstrate the business opportunity to unlock billions in climate finance and deliver on multiple SDG goals

- Our 2018 research demonstrated the financing opportunity to achieve universal household electrification in Africa (SDG 7) via off-grid solutions.

- First launched on **Earth Day 2021**, and covering all of Sub-Saharan Africa, this research shows off-grid solar's social dividends, which cut across numerous SDGs1

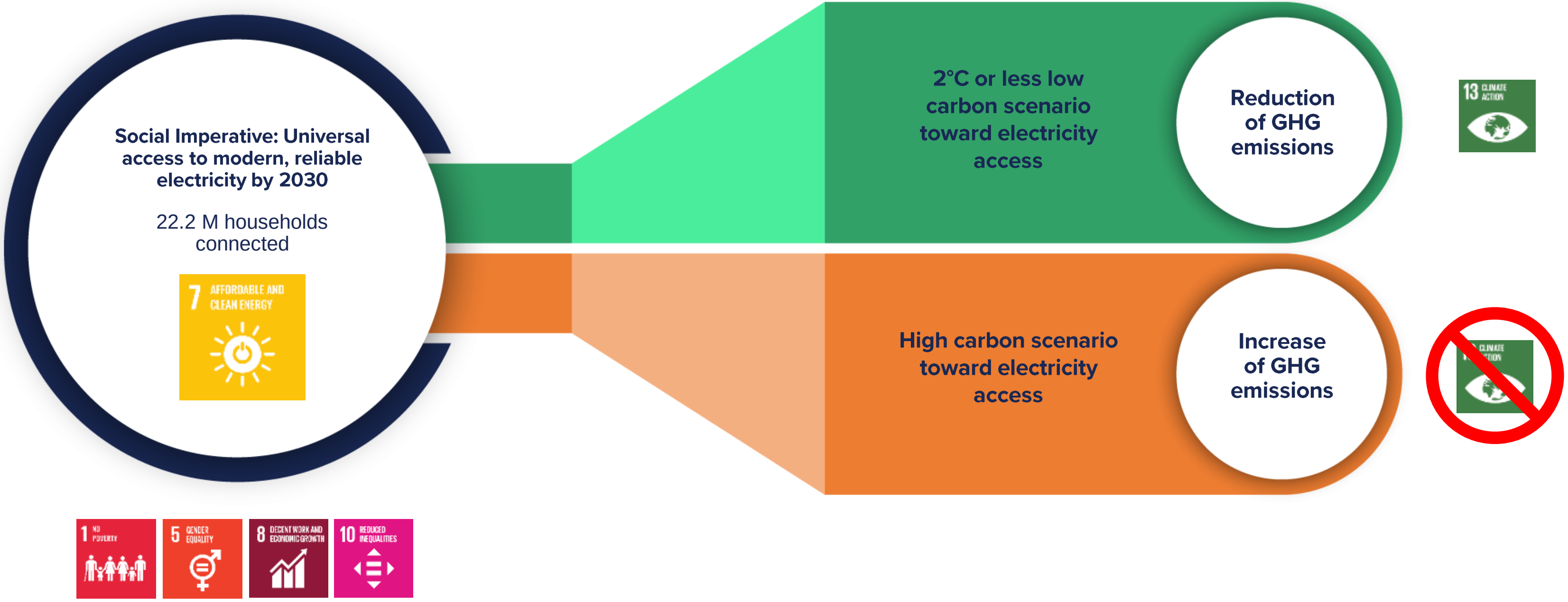
- Alongside the **climate dividends** attributable to low-carbon SDG 7 scenarios

- It forecasts the **climate finance opportunity** associated with these low-carbon SDG 7 scenarios

- Illustrating the **multi-billion-dollar climate finance opportunity** associated with the low-carbon scenarios

Modeling illustrates Ethiopia's low-carbon scenarios and impact they will have on SDG 13

SDG 7 – Ensure access to affordable, reliable, sustainable and modern energy for all
SDG 13 – Take urgent action to combat climate change and its impacts



Low-carbon scenarios accelerate Ethiopia's achievement of SDG 7 and SDG 13 via 3 pillars

Predictive modeling forecasts three scenarios for each thematic pillar: business-as-usual, high-carbon, and low-carbon, shows the avoided emissions between the latter two, and then provides the investment costs associated with the low-carbon scenario

Electricity Access

+

Unreliable grid

+

Cleaner cooking

=

Ethiopia's Climate Finance Opportunity

Improving access and reducing emissions across the continent

What level of CO_2 emissions are avoided via each pillars' low-carbon scenario? What is the associated climate finance opportunity?

Electricity access
Providing first-time electricity access

What will it take to provide first time electricity access in Ethiopia via a low-carbon trajectory that avoids millions of tons of CO_2 emissions?

Greening back-up generation
Solving the unreliable grid challenge

What's required to get enterprises and households to transition off back-up generators and onto distributed renewable sources of power?

Modern cooking access
Moving households onto modern cooking solutions

What is a credible scenario to move a portion of Ethiopia's households onto modern cooking solutions?

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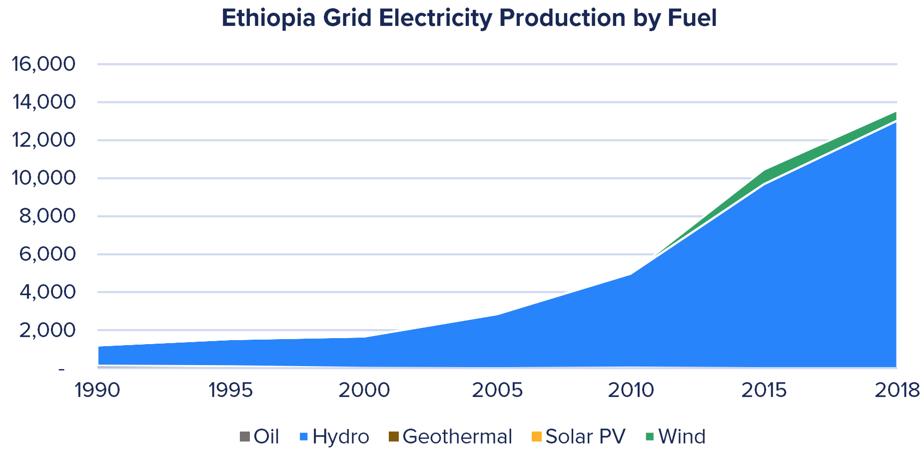
Setting the Scene

Ethiopia's grid generation is dominated by hydropower

This impressive renewable generation mix represents a huge climate opportunity for Ethiopia

- > **95%** of generation from **hydropower** in 2018
- > **4%** of generation from **wind and solar** in 2018
- > **172%** increase in generation since 2010, averaging 21% annual growth

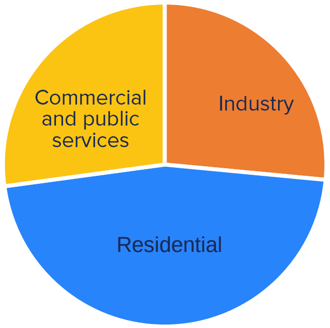


Source: International Energy Agency

Ethiopia's underdeveloped C&I sector means residential customers drive electricity demand

- **69%** of global electricity demand driven by industrial and commercial off-takers
- **54%** of Ethiopia's electricity demand driven by industrial and commercial off-takers
- **27%** of global electricity demand originates from households
- **46%** of Ethiopia's electricity demand originates from households due in large part to low residential tariffs
  - Starting at **$0.006 / kWh for <50 kWh** consumption in a month and just **$0.046 / kWh for up to 300 kWh**. These tariffs are expected to increase over time to support cost recovery for the utility

Ethiopia Electricity Consumption by Sector (2018)



Source: International Energy Agency *World Energy Balances 2020*; Ethiopia Electric Utility
[1]All $ in the deck refer to United States dollars (USD)

High residential demand explained by Ethiopia's retail power tariffs, among lowest globally

Tariffs likely to increase over time to better support utility cost recovery; low tariffs present an opportunity to further boost demand via productive use activities, electric mobility, and electric cooking

Residential Electricity Tariffs

Monthly Usage	Tariff (birr/kWh)	Tariff ($/kWh)
Up to 50 kWh	0.273	0.006
Up to 100 kWh	0.767	0.018
Up to 200 kWh	1.625	0.037
Up to 300 kWh	2.000	0.046
Up to 400 kWh	2.200	0.051
Up to 500 kWh	2.405	0.055
Above 500 kWh	2.481	0.057

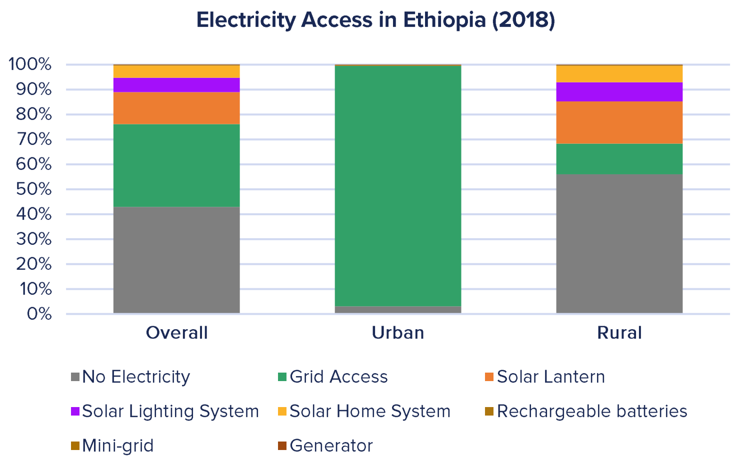
Industrial Electricity Tariffs

Usage	Tariff (birr/kWh)	Tariff ($/kWh)
LV Flat Rate	1.531	0.035
LV Demand Charge	200	4.6
MV Flat Rate	1.193	0.027
MV Demand Charge	147.54	3.393
HV Flat Rate	0.928	0.021
HV Demand Charge	87.64	2.016

Source: Ethiopia Electric Utility

Ethiopia's grid highlights a significant divide between urban and rural customer segments

Only **33% of households** in Ethiopia had electricity access from the national grid in 2017, representing about 35 million people

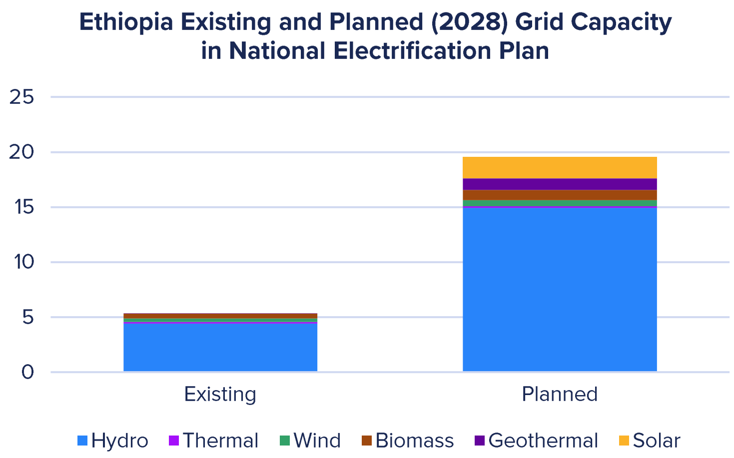


- About **12.5 million**, or 43%, of households in Ethiopia lack access to any modern electricity services in 2017
- **23.5%** of households (25 million people) got their power from standalone solar solutions (SHS, multi-light point or lanterns)
- About **13.7 million** households will still be without access by 2030 under a business-as-usual scenario

Source: Ethiopia MTF Survey; Catalyst estimates; Regional and national totals may differ due to different data sources

Ethiopia has host of factors that favor grid densification as the main access pathway

Installed and future electricity capacity is dominated by hydropower and other renewable energy sources



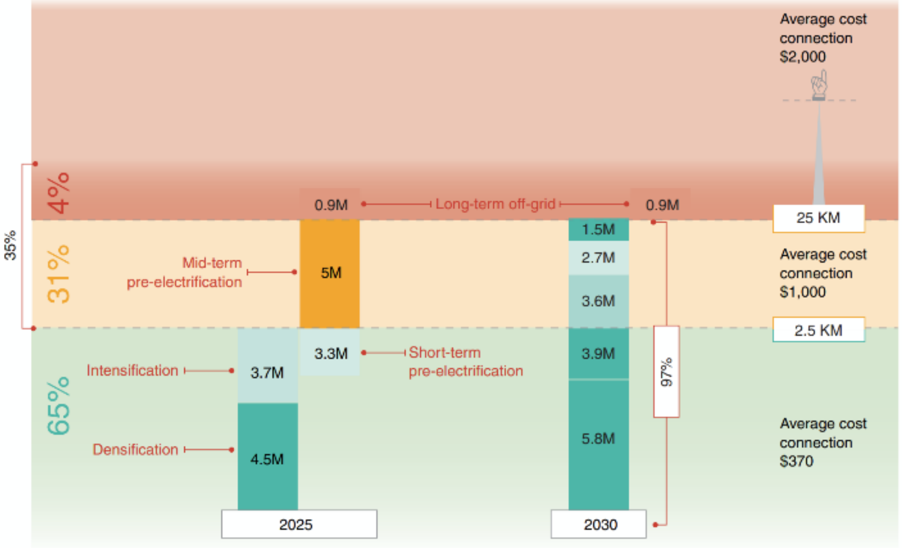
- **Over 90% of people** live less than 10km from the existing grid (78% less than 5 km away)
- The **6 GW** Grand Ethiopia Renaissance Dam will more than double Ethiopia's capacity
- Ethiopian government plans to also add another **8 GW** of solar, wind, geothermal, and other hydro by **2028**
- This also highlights an opportunity for regional exports of clean power to neighboring countries

Source: Ethiopia MTF Survey; Catalyst estimates; Regional and national totals may differ due to different data sources

Ethiopia’s strategy leverages modern technology and the private sector to deliver access

The National Electrification Program (NEP) 2.0 and recent Mini-Grid Directive underscore the government’s willingness to utilize decentralized renewables

- NEP 2.0: off-grid program to reach 35 percent of the population by 2025
- Complements the overall NEP, which targets 97% grid access by 2030 (with the remainder served by off-grid solutions)
- NEP is a living document and is expected to be updated again in 2022 with off-grid solutions becoming a more prevalent component
- November 2020 Mini-Grid Directive provides clarity on licensing, tariff setting, and technical and service standards as well as grid encroachment



Source: Ethiopia *National Electrification Plan 2.0*; Ethiopia Electric Authority

Broader regulatory reforms will also help facilitate the flow of climate finance into Ethiopia

Ethiopia's reform program unlocks new opportunities, though many of these are yet to be tested in the market and other structural challenges remain

New investment law

- 2020 legislation undertakes significant reforms and liberalization to open the economy to external investment
- New legislation opens the door for foreign investment in mini-grid development, standalone solar

Mobile money liberalization

- 2020 directive allows non-bank financial institutions to offer mobile money services
- Paves the way for expanded offering and competition in the marketplace
- Enables consumers to purchase energy services via digital wallets

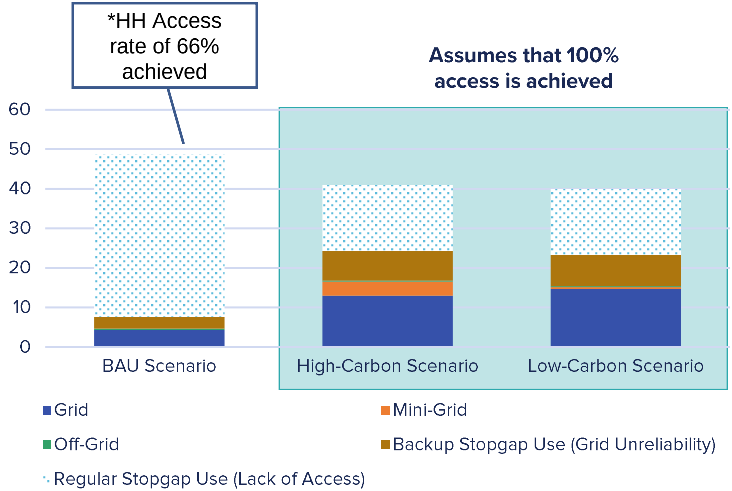
Access to foreign currency

- Remains a critical impediment to sector growth
- Access to hard currency is tightly regulated and often inaccessible to private sector enterprises
- DBE working capital facility has addressed this challenge, though broader currency reforms would crowd in new players

Electricity Access: Pathways and Gamechangers

Tier 1 Pathway: Ethiopia's clean grid leads to modest avoided emissions between scenarios[1]

However, there are significant emissions **(5.2 MT) from backup stopgap usage** due to grid unreliability



Scenario		Connections	Climate Finance Opportunity
BAU		**Total Access Rate: 61%** No Access: 13.7M HH Grid: 15M HH Mini-grid: 0.1M HH Off-grid: 6.3M HH	**Total: $445 Million** Mini-grid: 41M Off-grid Solar: 404M
High Carbon		**Total Access Rate: 100%** Grid: 27M HH Mini-grid: 3M HH Off-grid: 5.1M HH	**Total: $1.9 Billion** Mini-grid: 1.6B Off-grid Solar: 281M
Low Carbon[1]		**Total Access Rate: 100%** Grid: 29.2M H Mini-grid: 1M HH Off-grid: 5M HH	**Total: $974 Million** Mini-grid: 706M Off-grid Solar: 268M

No Access | Grid | Off-grid | Mini-grid

Impact — **22.2 million households get first-time access**

Financing opportunity — **$974M (Low-Carbon)**

[1]The low-carbon scenario has lower estimated emissions than the BAU scenario since emissions from electrification activities are more than offset by reductions in stopgap emissions. High-carbon scenario assumes a larger portion of primarily diesel and diesel-hybrid mini-grids than the low-carbon scenario. Tier 1 access is the minimum threshold for these scenarios and is defined as at least 4.3 kWh of electricity consumption per household per year – supporting basic lighting and device charging

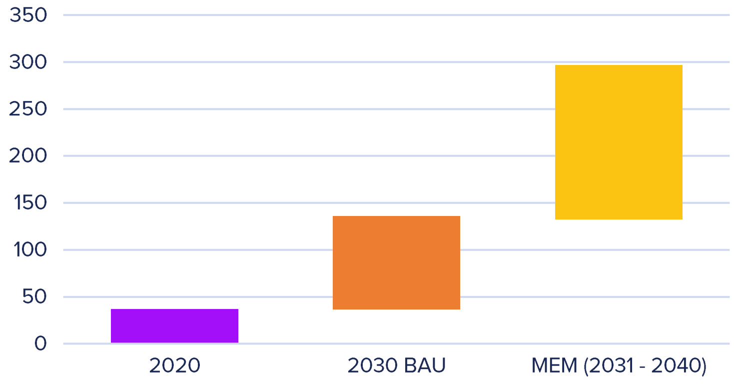
Source: Catalyst estimates

MEM Pathway: Ethiopia is on track to meet the Modern Energy Minimum* by 2040

To achieve the MEM (300 kWh/capita/year) by 2040, per person consumption needs to eclipse an average of 130 kWh by 2030

- BAU forecast for generation in Ethiopia indicates that the country will produce **136 kWh / capita / year** by 2030, necessitating increased electricity demand from residential and productive sectors
- **Appliance density and household purchasing power** is needed to increase demand. At current prices, **136 kWh / capita / year** would amount to **$0.82 / capita / year** in consumption which highlights the cost of appliances, not power as the potential barrier
- **Interventions such as productive use enterprises particularly in agriculture, electric cooking, and even electric transport** will help boost demand and lift Ethiopia out of energy poverty

Available generation per capita currently, under BAU, and on-track for MEM



*The MEM calls for a higher, more inclusive level of electricity consumption as a better access metric to raise global energy ambitions; Energy for Growth Hub, 2020.
Source: Catalyst estimates

Gamechanger 1: Scaling mini-grids to accelerate grid expansion and tackle reliability issues

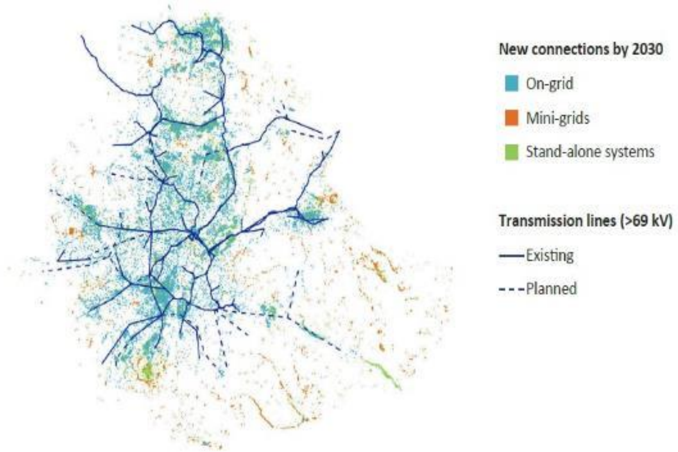
Ethiopia's NEP calls for about 300 mini-grids with 220,000 connections by 2030. More ambition could yield additional benefits

The Challenge

- Ethiopia's path to low-carbon, universal electrification can largely be met by the **enormous, clean potential of the national grid**
- Grid expansion will take **many years and billions in financing**; increasing demand will likely exacerbate grid reliability challenges
- Ethiopia has **limited experience** in the deployment of MGs and has only recently begun rollout of a mini-grid regulatory regime

The Opportunity

- Significantly **ramp up the deployment of mini-grids** built to be grid interconnected to target 1 million connections
- Strategic deployment within the planned distribution footprint will help accelerate grid expansion
- Once interconnected with the grid, these assets can benefit from **Ethiopia's surplus of renewable power**
- Mini-grid "nodes" can help relieve congestion, support power quality, island critical load pockets, etc., **greatly enhancing grid reliability**



Source: Ethiopia *National Electrification Plan 2.0;* IEA

Gamechanger 1: Impact and key design considerations

US$ 706 Million in mini-grid investment to support accelerated mini-grid deployments

Key Design Considerations

- The **2020 Mini-Grid Directive** is an important first step, though detailed regulations are required in order to unlock the market.
- This includes **details on licensing, tariff rules, and interconnection** details (both commercial and technical).
- The commercial structure of these mini-grids needs to balance **private sector participation** (in financing, constructing, and operating assets) alongside potential grid interconnection
- The public sector could also play a **role in financing and assets**, in partnership with private sector operators
- Ethiopia's reform agenda paves the way for **foreign investment** into certain sectors, though precedent is yet to be set for mini-grid investment
- This could be fast-tracked, with a **high-level government champion** helping push the agenda

Gamechanger 1 Impact

- **1,000 mini-grids**
- **1,000,000 connections** (enterprise and residential)
- **0.45 MT of avoided CO_2** (modest because of small HH cohort & low stopgap emissions)
- **90% reduction in downtime** and backup stopgap usage

Sources: Catalyst estimates; Government of Ethiopia

Gamechanger 2: Eliminate household emissions from backup lighting due to grid challenges

Ethiopia's unreliable grid forces households with grid access to also use back-up stopgap solutions for lighting

The Challenge

- **78% of households** use kerosene and candles as their stopgap lighting solution
- **7.8M tons** of cumulative CO_2 stopgap emissions
- Stopgap sources are expensive, and deliver **inferior lighting** relative to modern solutions
- Stopgap sources contribute to household air pollution, which kills approximately **64,000 Ethiopians each year**

The Opportunity

- Incentivize grid-connected households that utilize kerosene for back-up lighting to **adopt rechargeable torchlights**, capable of meeting lighting needs during grid outages

Sources: Ethiopia MTF; WHO; Catalyst estimates

Gamechanger 2: Impact and key design considerations

$217 million intervention cost, assuming $ 7 per unit and one replacement per participating household through 2030

Key Design Considerations

- Participating households will be **grid connected**; program could be administered through EEU
- To facilitate uptake, households could be offered a **payment plan** for the lighting solutions over a period of months
- To further drive uptake, the **cost of devices could be subsidized** via climate financing specifically tagged to the avoided emissions

Gamechanger 2 Impact

- **15.5 million households** eliminate stopgap emissions from back-up kerosene lighting
- **Avoid 5.2 MT of CO_2** emissions by 2030
- Households **save ~$2/month** on kerosene fuel costs
- Avoided emissions could be monetized to pay for program (e.g. $10/ton mobilizes **$52M**

Sources: Catalyst estimates; Government of Ethiopia

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Tackling Access Reliability Challenges

Unreliable grid[1] connections force Ethiopian enterprises to use fossil fuel-powered gensets

As Ethiopia's utility struggles to keep up with growing electricity demand, grid reliability will likely worsen, exacerbating dependency on expensive, polluting backup generators

Unreliable grid connections

- In developing countries, unreliable grids are the primary driver for genset use:
- About **75 percent of sites** using fossil-fuel powered gensets are "grid connected"

In Ethiopia alone:

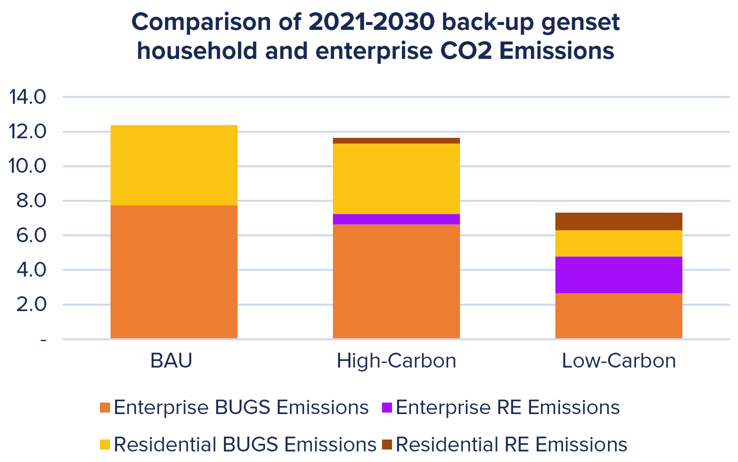
- **80 percent of firms** experience outages
- **8.2 outages in a typical month** for total downtime of 47.5 hours (**~6.4 percent downtime**)
- Unreliable grid connections result in an average **6.9 percent loss** in business revenues

Use of backup gensets

- Backup fossil-fueled generators are used by households and enterprises
- Ethiopia's current fleet is **62k units**, with **3 GW installed capacity**
- Powered with fossil fuels, typically diesel or gasoline
- Ethiopia's fleet consumes **372 million liters/year** of fossil fuels
- Off-grid enterprises often resort to using gensets for power, particularly for productive use applications
- Some off-grid household use, though fuel costs make them unaffordable for most

[1] An unreliable grid is defined as one in which local enterprises, on average, report 12 or more hours of electrical outages in a typical month;
Source: World Bank Enterprise Surveys; IFC *Dirty Footprint of Broken Grid* ; SERC estimates; Catalyst estimates

Replacing gensets with renewables reduces 4.3M tons compared to high carbon scenario



- Emissions reductions are driven by the growth rate in back-up genset fleets and the rate at which back-up gensets are replaced by renewables; replacement rates vary across scenarios[1]
- BAU has highest carbon footprint because renewables do not become part of the fleet mix

[1] High carbon scenario assumes 10% of gensets are replaced with renewables at end of life; low-carbon assumes 50%
Sources: IFC *Dirty Footprint of Broken Grid*; SERC estimates; Catalyst estimates

Gamechanger 3: Deploy battery storage at enterprises to reduce generator use

Ethiopia's unreliable grid forces households with grid access to also use back-up stopgap solutions for lighting

The Challenge

- **64%** of all generator capacity in Ethiopia are grid-tied medium and large commercial systems (150 kW – 1 MW)
- **2 GW** of installed capacity
- Grid outages cause **6.2% downtime** and **6.9% in revenue loss**
- Fleet spends **~$75M per year on fuel** (at current US$ 0.40/liter)
- This fleet would emit **6.5 M tons of CO_2** cumulative emission by 2030

The Opportunity

- These assets are grid tied, and the grid provides incredibly clean, yet unreliable power
- Therefore, **these sites need storage to "bank" clean grid electricity** when it is available, using it when there are grid outages
- **Savings on genset fuel, upkeep, and replacement** could help defray costs of battery storage installations
- Further, enterprises could be compensated for voltage and frequency regulation, demand response, and other grid services
- The cost of high quality, lithium-ion batteries has fallen by **89% to $137/kWh since 2010** and are expected to fall to close to $100/kWh by 2023

Sources: World Bank Enterprise Surveys; BNEF; IFC *Dirty Footprint of Broken Grid*; SERC estimates; global petrol prices; Catalyst estimates

Gamechanger 3: Impact and key design considerations

$2.5 billion required to replace all commercial on-grid gensets with stand-alone storage

Key Design Considerations

- **Bulk procurement of batteries** could facilitate lower equipment costs
- Better geospatial understanding of genset fleet to help highlight opportunities. For example, existing industrial parks or agricultural clusters may be good targets for **decentralized storage solutions**
- **Tax/VAT exemptions** will lower the cost to consumers and help accelerate uptake
- **Regulatory framework** for distributed renewables and storage solutions should include requirements for electricity standards, grid interconnection of devices for safety and metering, etc.
- **Net metering and other regulatory and market structures** to compensate distributed storage for providing grid services and demand response to support broader grid reliability

Gamechanger 3 Impact

- Displace **2 $MtCO_2$ of emissions** cumulatively by 2030
- Install **10.5 GW** of battery storage capacity
- Reduce downtime by **6.4%**
- Increase revenue by **6.9%**
- Eliminate over **$750 million** in fuel costs for businesses

Sources: Catalyst estimates; Government of Ethiopia

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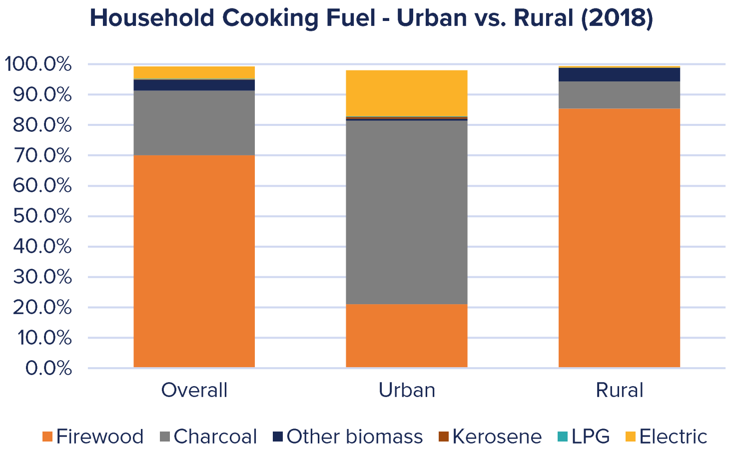
Cleaner Cooking

Firewood and charcoal dominate, with notable 15% electric cooking in urban areas

25M households use firewood, briquettes, kerosene, or charcoal as their main fuel (~96% of households)

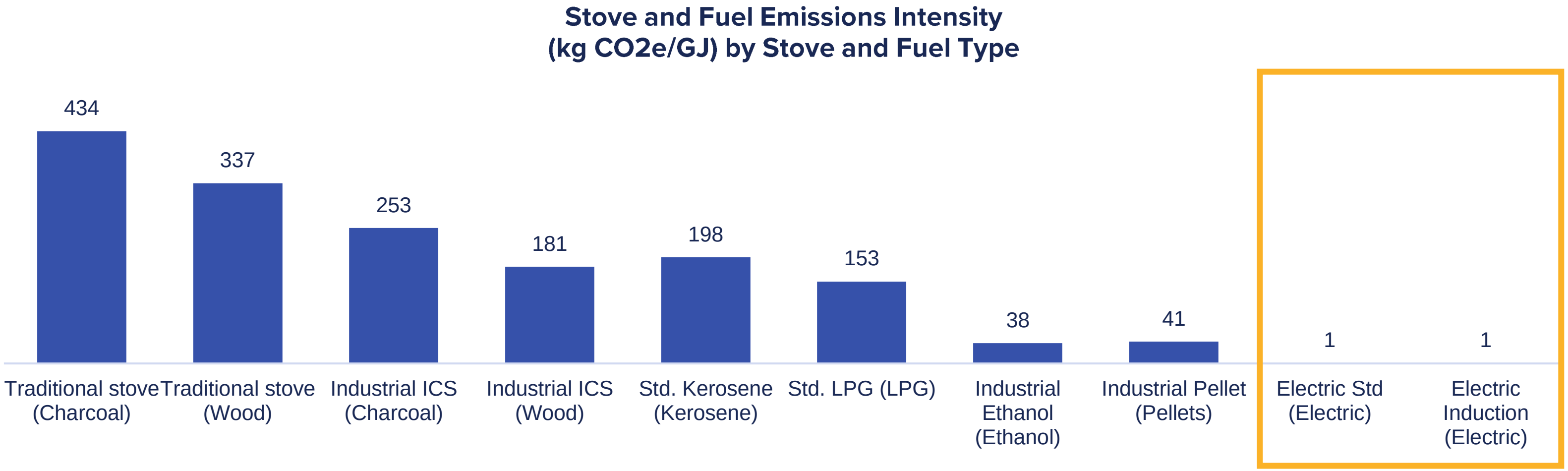


- **64,000** people killed annually from household air pollution
- **4%** of households (15% in urban areas) cook primarily with electric stoves (~0.9 million households)
- **27%** of households stove/fuel stack (~6.7M households)

Source: World Bank *Multi-Tier Framework 2019 – Ethiopia*; WHO *Global Health Observatory*

With low emissions and excess capacity, Ethiopia's ideal modern pathway via electric cooking

Electric stoves have huge emissions reductions potential compared to other common options due to greater than 99% renewable energy in the generation mix, particularly hydropower



*Each fuel has a GHG emissions intensity factor (kgCO_2e per gigajoule of fuel burned) which illustrates the carbon-intensity of the fuel when burned. When used in a particular stove, only a percentage of the burned fuel is converted into useful energy, resulting in a higher GHG emissions intensity in practice.
Source: Authors' analysis based on multiple sources including Penisse et al, Bailis et al, Clean Cooking Alliance's Clean Cooking Catalog, inter alia.

Gamechanger 4: Scaling up electric cooking

Ethiopia has the key ingredients to avoid millions of CO_2 emissions via electric cooking: clean, cheap grid electricity, and good market uptake

The Challenge

- **96% of households cook with emission intensive fuel** sources, notably firewood, briquettes, kerosene, or charcoal
- **15% of urban households cook with electricity**, demonstrating a willingness and ability to transition to modern cooking
- **Stopgap fuels are costly**: households spend an average of **$6.84/month on charcoal.** Meanwhile the cost to cook with electricity would average $3.04/month
- Transitioning to electric cooking necessitates the **purchase of electric cooking appliances** (electric pressure cookers, induction stoves, etc.)

The Opportunity

- **Household savings from electric cooking** can be used to enable pay-as-you-save or other on-bill financing programs.
- Development partners could support the government or electric utility to **pre-finance appliances**; households would pay for over time via small monthly deductions from their electric bills.
- **Emissions savings can be tracked and monetized as carbon credits**, the proceeds of which can help subsidize upfront capital costs of the appliances or to finance consumer awareness campaigns

Sources: Modern Energy Cooking Services (MECS) *Ethiopia Cooking Transitions*

Gamechanger 4: Impact and key design considerations

$878 million investment required to produce and distribute electric stoves, and support downstream upgrades for distribution, metering, etc.

Key Design Considerations

- Electric cooking **necessitates a robust electric grid**, which needs to be included in integrated electrification planning; grid-strengthening ancillary investments will need to be financed.
- **Leverage existing pilots** (e.g. MECs) to track and certify emission reductions from electric cooking.
- **Customer financing options like PAYGO or Pay-as-you-save** approaches to make appliances affordable
- **Support local manufacturing** of electric cookstoves, particularly electric pressure cookers, to help scale up the electric cooking sector in Ethiopia
- Explore potential for **commercial electric cooking schemes**, particularly for injera bread as a starting point for electric cooking acceptance and predictable planning for electricity demand

Gamechanger 4 Impact

- **5.2 million households** adopt electric cooking
- **21 million tons of CO_2 emissions** avoided
- Households could save over **$3.50[1] in fuel costs each month** over the cost of charcoal.
- At a price of $10 per ton of CO_2, **$210M of carbon finance** could be mobilized.

Sources: Modern Energy Cooking Services (MECS): Ethiopia cooking transitions; Catalyst estimates
[1]Assumes a 2018 exchange rate of 27.66 BIRR/US$ reflecting survey timing

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Summarizing key findings

Ethiopia's energy sector: summary of access pillars

Ethiopia's presents a mix of challenges and opportunities that need to be factored into their low-carbon universal access pathway

Electricity access

- Power from Ethiopia's grid is incredibly clean, with **99% generated by renewables**
- Grid power is incredibly cheap, with the lowest residential tariff band costing **US$0.006/kWh**
- **Plentiful supply**; Ethiopia positioned to become a power exporter
- Yet **43% of Ethiopian households** have no access to electricity

Unreliable grid

- Ethiopia's grid, where available, is unreliable, with enterprises experiencing an average of **6.4% downtime**, and **6.9% revenue losses**
- Consequently, there are an estimated **62,000 backup gensets (3.1 GW)** deployed in the country today
- These gensets consume **372 million liters / year** of fossil fuels

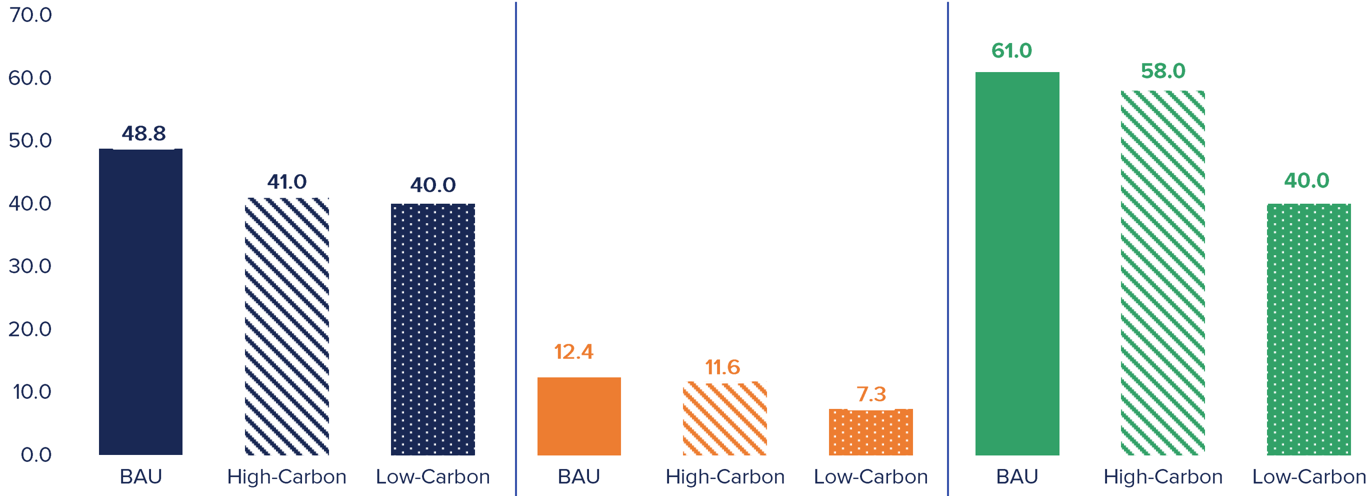
Cleaner cooking

- **95.1%** of Ethiopia's population use solid fuels for primary cooking needs
- **64,000 people** in Ethiopia die annually from household air pollution
- **>4% of all households** have already transitioned to electric cooking, offering a clear pathway to modern, clean cooking

Source: World Bank *Multi-Tier Framework- Ethiopia; IFC Dirty Footprint of Broken Grid;* SERC estimates; Catalyst estimates

Low-carbon access scenarios avoid 23.3 million tons of CO_2 through 2030, deliver significant SDG 7 impacts, and unlock a climate finance opportunity

Emissions from plausible low-carbon scenarios are benchmarked against equally plausible high-carbon counterfactuals; the difference between the two constitutes the avoided emissions



	Access	Unreliable Grid	Cooking
Avoided CO2	1 MT CO_2 Avoided	4.3 MT CO_2 Avoided	18 MT CO_2 Avoided
Impact	22.2 million households get first-time access	62,000 gensets retired	4.9 million households using clean fuels
Financing opportunity	$974M	$4.9B	$878M

Summing up: Ethiopia's low-carbon path

Ethiopia could unlock a **$6.7 billion-dollar climate finance imperative** and lead on climate friendly universal access

A low-carbon scenario contributes massively toward universal access

- **22.2 million** new connections for energy access delivered
- More than **62,000 gensets** used by enterprises and households replaced
- More than **4.9 million households** with new electric cooking access

A low-carbon scenario benchmarked vs. a high-carbon scenario yields

- **23.3 million tons** of avoided CO_2 emissions over the next decade

A low-carbon scenario requires substantial volumes of new capital

- **$973 million** climate finance opportunity for **first time access**
- **$4.9 billion** climate finance opportunity to **green back-up** generation
- **$878 million** climate finance opportunity for **clean cooking**

Potential gamechangers to accelerate energy access and development in Ethiopia

Grid Connected Mini-grids	> An aggressive rollout of renewable powered mini-grids will help accelerate Ethiopia's ambitions to expand the centralized grid system > This hub-and-spoke approach, with mini-grids that are designed to be interconnected, will also enhance **grid reliability and resiliency**
Addressing Stop-gap Usage	> Ethiopia's unreliable grid generates significant emissions from back-up stopgap usage (78% from kerosene and paraffin) > The Ethiopia Electric Utility could offer customers a Tier 1 equivalent solar solution that they could use in the event of outages; could avoid an **additional 5.2 MT CO_2 of emissions by 2030**
C+I Battery Storage	> 64% of Ethiopia's genset fleet is for commercial applications. EEU generates cheap, clean grid power, but experiences numerous outages, forcing enterprises to invest in diesel gensets > This fleet could be sunsetted via a $2 billion program to deploy grid-tied battery storage into these businesses (providing autonomy when there are grid outages**, saving 2 MT CO_2 emissions**
Electric Cooking	> Ethiopia's combination of plentiful, inexpensive, renewable power creates a unique opportunity for grid-connected households that cook with charcoal > In addition to providing significantly lower costs to cook, transitioning these households to electric cooking **could avoid over 20 MT of CO_2 emissions**

Commissioned by

Shell Foundation

In partnership with

The Rockefeller Foundation

Sustainable Energy for All

Produced by

Catalyst Off Grid Advisors

Backup genset research produced in association with

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Backup genset research was based on previous work commissioned by

IFC International Finance Corporation World Bank Group

Creating Markets, Creating Opportunities

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