Innovative Finance for Energy Access: Key Tools, Challenges, and Opportunities for Mobilising Finance in the SDG 7 Space

endev

Learning & Innovation

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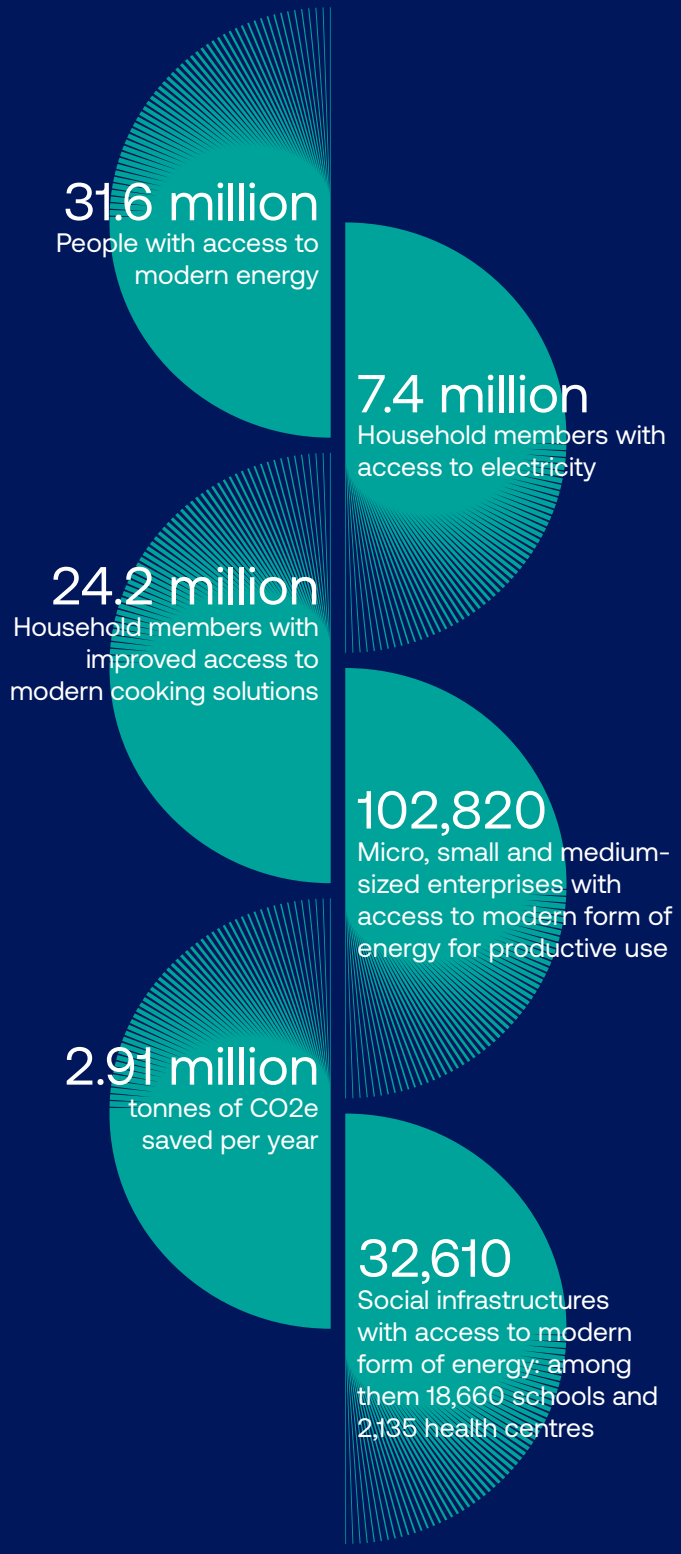
EnDev at a glance



As of 2022, 685 million people still lacked access to electricity and 2.1 billion people lacked access to clean cooking technologies[1]. This has a dramatic impact on quality of life, environment, health, education and income opportunities. Energising Development (EnDev), being one of the largest on-the-ground technical assistance programmes for energy access, focuses on facilitating access to modern, renewable energy in more than 20 countries of the world. This is a pivotal factor in strengthening socio-economic development and combatting climate change.

EnDev's drive is to improve the lives of the most vulnerable people; ensuring no one is left behind. Economic opportunities and green jobs are created by building markets for modern, renewable energy. EnDev contributes to reducing greenhouse gas emissions to protect our planet's climate. Its approach is to empower structural, self-sustaining change; kick-starting market and sector development that evolves further without support from EnDev.

As a multi-donor energy access programme, EnDev is currently financed by four donor countries: Germany, the Netherlands, Norway and Switzerland. A number of other government and charitable donors provide additional funding. EnDev is co-managed by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Netherlands Enterprise Agency (RVO).

1 IRENA. 2024. Tracking SDG 7: The Energy Progress Report.

EnDev Learning & Innovation Agenda

To spur and structure learning and knowledge exchange within EnDev and the SDG 7 community, the EnDev Learning & Innovation Agenda (ELIA) was created in 2020 to facilitate learning and knowledge sharing via regular exchange meetings, as well as to develop knowledge products based on shared experience and research. ELIA encompasses the set-up of a Community of Practice (COP) on specific thematic topics. So far, the following practitioner groups have been created: Clean Cooking and Behavioural Change, Humanitarian Energy, Productive Use of Energy, and Rural Electrification. This document complements the previous ELIA themes with an additional topic on "Innovative Finance for Energy Access" through which EnDev aims to enhance literacy around the financial tools for energy access, identify important innovations that contribute to closing the financing gap for SDG 7, and understand where more innovation is needed. It is essential that EnDev practitioners understand and engage in innovative efforts to attract finance to the space. Fostering companies' transition to financing their operations on increasingly commercial terms is a key piece of EnDev's overarching goal of market development. The aim is that the knowledge compilation shared in this document leads to a higher pace of implementation, actively feeds into new pilots and project ideas, and generally increases the impact of the EnDev programme and beyond.

The process of setting up the ELIA group on Innovative Finance for Energy Access was supported by New Silk Roads which also developed, together with the EnDev experts, the present knowledge product.

List of abbreviations

AfDB	African Development Bank
C&I	Commercial and Industrial
CoP	Community of practice
DFI	Development finance institution
DRE	Distributed renewable energy
D-REC	Distributed renewable energy certificate
EnDev	Energising Development
G4A	Green4Access
GCF	Green Climate Fund
GEAPP	Global Energy Alliance for People and Planet
GDC	Global Distributors Collective
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOGLA	Global Off-Grid Lighting Association
HICs	High-impact countries
IEA	International Energy Agency
KfW	German Development Bank
KPI	Key performance indicator
LEAF	Leveraging Energy Access Finance
LMD	Last-mile distributor
MDB	Multilateral development bank
NAP	National adaptation plan
NDC	Nationally determined contribution
OGS	Off-grid solar
PAYGO	Pay-as-you-go
PUE	Productive use of energy
REC	Renewable energy certificate
RBF	Results-based financing
RVO	Netherlands Enterprise Agency
SEforALL	Sustainable Energy for All
SHS	Solar Home System
SME	Small and medium-sized enterprise
SPM	Smart Power Myanmar
TCX	The Currency Exchange Fund
UNFCCC	United Nations Framework Convention on Climate Change

Executive summary

This knowledge product represents a collective effort to take stock of the financial tools in use in the SDG 7 community. It draws on the experience of funders and financiers, implementing organisations and energy access companies as well as existing research on financing in general and for energy access specifically. The knowledge product lays out the various mechanisms used to fund projects and companies and address existing gaps and barriers that prevent companies from getting the capital they need. In line with EnDev's focus on energy access for rural and remote communities, specific attention is given to four main market segments: off-grid solar, mini-grids, clean cooking and productive use of energy.

In order to better analyse the tools available in the space, a definition of innovative finance is presented, which was developed in cooperation with the EnDev community of practice. Drawing on the available literature and expert interviews, innovative finance is defined here as any mechanism that does the following:

- Experiments with the application of new or traditional tools;
- Allocates capital in an effective and efficient manner;
- Mobilises additional sources of finance.

Building on that definition of innovative finance, the report includes a toolbox of the most common financial tools used in energy access, with specific attention paid to the challenges and success factors vis-a-vis their deployment. While no single mechanism is innovative on its own, they form important building blocks from which innovative financing can be constructed. The following broad categories are discussed:

- **Grants** can be used by programmes like EnDev to implement pilot projects in early-stage or high-risk markets, but their use carries a risk of market distortion. It is important that grants or subsidies are deployed with clear and realistic plans for phase-out.

- **Debt and debt-like instruments** are essential for funding operations as a company matures. The key challenge to unlocking affordable debt financing for energy access is in bridging the gap between requirements of lenders and companies, as early-stage energy access companies may struggle to meet lender requirements. Various forms of support to increase companies' finance readiness and strategies to mitigate risk for lenders, can help facilitate access to affordable debt.

- **Equity** can play an important role in financing company growth, but it can be challenging for energy access companies to attract equity from traditional investors due to their small size, higher level of perceived risk as investments and relatively low returns. It is crucial to identify and engage sources of impact-driven and patient equity in the energy access space.

- **Risk-sharing instruments** involve strategic deployment of concessional capital to de-risk investments in companies and projects, and attract new investors. These instruments are best employed alongside non-financial approaches to address specific risks and crowd in additional capital from more commercially oriented financiers.

- **Emerging tools** like carbon finance, D-RECS, aggregation, and anchor-based financing can support companies' financing journey by improving their balance sheets, unlocking additional revenues or reducing costs. However, many of these tools require significant knowledge and access to finance to unlock, making them difficult for smaller companies to access.

Building on this array of tools, current trends in innovative finance are then outlined. Given EnDev's focus on supporting emerging companies and nascent markets, this section begins with a discussion of access to finance barriers faced by SMEs and how innovative finance mechanisms can (and cannot) address these challenges. The following key barriers were identified:

- Investment readiness
- Ticket size

- Heightened risk perception
- Due diligence burden
- (Dis)continuity of finance
- Lack of access to local currency financing

None of these barriers have a simple, one-size-fits-all solution. Energy access start-ups often find themselves piecing together funding from various sources using different mechanisms, both innovative and traditional. EnDev and other development partners have a key role to play in helping companies secure reliable financing on increasingly commercial terms in order to grow their business and build markets that provide inclusive energy access.

The remainder of this analysis discusses three innovative finance trends chosen for in-depth examination based on desk research and conversations with experts. The trends are as follows:

- **Crowdfunding:** Crowdfunding platforms have emerged as an important channel where companies can access finance more quickly, in smaller amounts and from new sources. However, more innovative partnerships are needed to increase the accessibility of this tool for certain market segments and despite an increasingly challenging macroeconomic climate.
- **Local currency financing:** Energy access companies frequently cite access to financing in local currency as a key constraint to growth. Unlocking affordable local currency financing from domestic financial institutions is a daunting task, but incremental successes will build a more resilient sector over the long term.
- **Climate finance:** As the impacts of climate change worsen, providers of concessional capital are increasingly focused on tackling this global challenge. Demonstrating the role of energy access technologies in supporting mitigation, and boosting community adaptation and resilience can unlock new sources of finance for the space. It can also maximise the role of energy access companies in fighting climate change.

The report concludes with recommendations for how EnDev and its partners, through their role supporting energy access SMEs, can foster innovation and help close the SDG 7 financing gap. At a high level, it is crucial that EnDev continues to support companies in preparing to access finance, deploy its funding in ways that mitigate risk for more commercial financiers and engage new partners in the space.

1 Introduction

1.1 State of play

Significant progress has been made in the last decade towards increasing energy access. According to the International Energy Agency (IEA), 91% of the global population was electrified and 74% had access to clean cooking solutions in 2022, compared to 84% and 57%, respectively, in 2010.[1]

Yet, the current pace of new connections is not sufficient to achieve SDG 7.1, which aims to ensure "access to affordable, reliable and sustainable energy for all" by 2030. Considering anticipated population growth and the current rate of access expansion, by 2030, global electrification will only increase by 1%, leaving 660 million people in the dark.[2] Access to clean cooking is projected to increase by only 5% in this period, meaning 1.8 billion people will remain reliant on traditional and inefficient cooking solutions, with significant negative implications on health and climate.[3]

Achieving universal access to modern energy by 2030 will require a significant scale-up of financial commitments. The IEA projects that achieving SDG 7.1 on time would require investments of $30 billion per year in electricity access and $8 billion per year in clean cooking between 2022 and 2030.[4] However, historical investment has been well below this level. According to Sustainable Energy for All (SEforALL) data for 2019, the most recent year available, annual investment committed to electricity supply benefitting residential users in high-impact countries (HICs) was only $12.4 billion.[5] The IEA reports that, as of 2022, total annual funding allocated for clean cooking was around $2.5 billion.[6]

Financing is central to building strong markets to enable access to electricity and clean cooking for households, social institutions, and productive use of energy. Put simply, the countries that have seen the greatest increases in energy access in recent years have attracted more capital. The reasons why some countries receive more funding than others vary, though factors such as the existence of clear policy targets for energy access and system planning, an enabling regulatory environment in both the energy and financial sectors, market size, political stability and ease of doing business can all play a role.

Although the estimated $38 billion per year needed to achieve SDG 7 targets is relatively small compared to the trillions of dollars needed to fund the larger global energy transition, innovative financing solutions are needed to mobilise this amount, channel it effectively, and maximise its impact.

1.2 The context of EnDev

Recognising the importance of closing financing gaps to achieve universal energy access and in line with the program's market-based approach, for the second cycle of the EnDev Learning and Innovation (L&I) Agenda, the community of practice (CoP) identified finance as a key area in which to deepen its expertise and capacity for innovation.

The goals of the 2023-24 EnDev Learning & Innovation Agenda on Innovative Finance were as follows:

1. Develop a unified definition of innovative finance for energy access;

2. Promote financial literacy through the preparation of a toolkit of traditional and alternative instruments for financing energy access;

3. Identify key areas where innovative approaches are being developed; and

1 IEA et al., "Tracking SDG 7: The Energy Progress Report."
2 Ibid.
3 Ibid.
4 Ibid.
5 SEforALL, "Energizing Finance: Understanding the Landscape 2021."
6 IEA, "A Vision for Clean Cooking Access for All.".

4. Understand energy access companies' needs and how to facilitate their access to innovative finance solutions.

This knowledge product explores the financing needs and challenges of off-grid energy access through a focus on four main market segments: clean cooking, off-grid solar (OGS), mini-grids, and productive use of energy (PUE), in line with the EnDev CoP's extensive experience working to support businesses serving remote and rural communities. Off-grid solutions are a key to achieving SDG 7.1. For millions of households around the world, and particularly in sub-Saharan Africa, where existing grid networks are severely limited, they currently represent the fastest and most cost-effective pathway to energy access. Under the IEA's Net Zero Emissions by 2050 Scenario, which models a pathway to achieving SDG 7.1 in line with global climate targets, 25% of new connections globally between 2022 and 2050 would come from standalone solar systems, while 31% would come from mini-grids.[7] PUE, meanwhile, has an important role to play in stimulating electricity demand and enhancing the viability of solutions for rural electricity access. For clean cooking, 30% of households of people in developing countries would use electric cooking, while 19% could rely on modern biomass and another 48% on gas and LPG under the Net Zero Emissions by 2050 Scenario.[8]

1.3 Methodology

The research for this project followed an iterative approach drawing on existing literature, the expertise of EnDev's CoP, and the experience of people working on the ground to implement innovative finance mechanisms for energy access.

As a first step, a kick-off survey of the CoP and in-depth follow-up interviews with respondents was used to develop a working definition of innovative finance, which was then refined based on a review of existing literature on finance for energy access. Interviewees were selected in partnership with the EnDev advisory team to ensure diversity in terms of years of experience, types of projects and financing tools used, geography, and specific implementing organisations. To ensure an exhaustive mapping of financing tools used by EnDev, the research team reviewed internal and public reports on the organisation's work. This review was supplemented by further literature review to develop a comprehensive list of tools in use within and outside EnDev for financing energy access. Sources consulted include industry reports and credible academic publications, a full list of which can be found in Appendix I. Further interviews and workshops were held with stakeholders that had relevant experience with several key tools to better unpack their role in innovative efforts to finance energy access.

7 IEA et al.
8 Ibid., 201

2 Defining Innovative Finance

Innovation is at the centre of achieving SDG 7.1. Financial and technological developments, such as pay-as-you-go (PAYGO), mobile money, and solar home systems (SHS), have driven marked increases in energy access over the last decade. Continuing this progress will require innovative financing strategies to close funding gaps, expand access, and foster sustainable economic development for all.

Despite the wide use of the term, there is no unified definition of innovative finance in the SDG 7 space. Some use innovative finance to refer to new technology and financial mechanisms, while others see new applications of or important tweaks to well-tested solutions as innovative finance as well. The following section draws on the characteristics of innovative finance in the context of international development more broadly, mostly clearly summarised in the UN Economist Network's review of the topic.[9] This general definition is expanded and adapted to the SDG 7 context by drawing on the expert insights provided by the EnDev CoP as well as a supplemental literature review.

In interviews, there was some debate over the definition of funding versus finance in the context of energy access. Concessional "funding" typically refers to money disbursed to a company without expectation of repayment. In the sector, it usually takes the form of grants provided by governments, development organisations or private philanthropic donors. On the other hand "finance" in its purest form refers to debt and equity provided to companies with the expectation of receiving repayment and returns. The terms attached to such finance can vary depending on whether it is provided by a commercial bank or investor or a more impact-focused entity. Developing large-scale essential infrastructure, particularly in more challenging market environments, typically requires some commitment of public funding as well as commercial finance. Innovative finance mechanisms for energy access also often combine both funding and finance in the form of blended finance mechanisms and innovative partnerships.

The concise definition of innovative finance developed through the research process is as follows:

Innovative finance is an experimental form of finance which channels money in an effective and efficient way and helps mobilise additional funding to close existing gaps.

The pillars of this definition are discussed in more detail below. Chapter 3 outlines some of the most common financing tools (both traditional and emerging) available in the energy access space and innovative ways to deploy them. Chapter 4 then uses the definition as a guide for exploring key trends in financial innovation for energy access.

2.1 Experimentation

Experimentation is at the heart of innovation, and in the energy access context, it can play out in several ways:

Deploying a newer financial tool to support energy access: Sector stakeholders have begun piloting and deploying a number of alternative financial tools which serve to improve the unit economics of energy access businesses (see chapter 4). Digitalisation has also led to the emergence of new tools to support energy access financing (see companion knowledge product).

Combining existing tools in new ways: While some new tools have begun to emerge, the traditional tools of grants, debt, and equity, along with guarantee instruments, remain the primary means of financing energy access. These tools are typically deployed together in blended financing vehicles or financing packages for companies. Deploying these traditional instruments in new combinations represents an innovation, even when the basic tools are not themselves new.

9 UN Economist Network, "Policy Brief: Innovative Financing Mechanisms and Solutions."

Applying tested approaches in new contexts: Innovation can also occur when these traditional tools or tested combinations are piloted and successfully adapted in new contexts. This context can be the development of a newer sub-sector, such as PUE, or adapting a financing approach to the conditions of a new country or market where it previously was not widely used.

2.2 Effective and efficient capital allocation

To achieve SDG 7, every dollar invested will need to have as much impact as possible. Mechanisms to ensure that every unit of investment mobilises additional capital and has cross-cutting benefits are also key to innovation:

Increasing the effectiveness of capital: Experimenting with new ways to better deliver financing at the right time and in the right amount to foster steady company growth at all stages of the capital continuum is innovation in its own right. Effective capital allocation should also have knock-on effects beyond the companies themselves, driving overall market development and achieving real results for communities.

Allocating capital efficiently: Transaction costs remain a major barrier for energy access companies, particularly small or early-stage ones, to access traditional commercial finance. New methods to reduce transaction and overall finance costs or speed up delivery of capital are important innovations that help maximise societal impact per dollar deployed.

2.3 Mobilising additional capital

Financing energy access will require more capital from partners who are new to the space. Crowding in more sources of funding and financing is another place for innovation:

Mobilising additional funds: Innovative finance must contribute to the broader goal of closing the $38 billion per year financing gap by ensuring that any concessional funds deployed are also attracting additional capital from new partners, in particular commercial sources. Mobilisation can occur via the effective design of blended finance vehicles and packages as well as through efforts to engage new financial actors in the energy access space. On the other side of the equation, efforts to prepare companies to meet the requirements of lenders and investors also represent an important space for innovation.

3 Energy Access Finance Toolkit

Financial literacy is a key challenge within the energy access space. Terminology is complex, and for many companies, understanding and evaluating the suitability of different types of financing is a major hurdle. Practitioners often have deep expertise in the financial tools with which they work directly, but they may lack a broader financial ecosystem view. This chapter aims to provide clarity about the traditional and alternative financing mechanisms for energy access. Figure 1 summarises the main categories of financial "tools" used to facilitate energy access, which are discussed in more detail in the following sections.

EnDev as a programme is mandated to deploy grants, though its CoP uses a wide variety of tools and works with companies in need of financial packages containing different instruments. A non-exhaustive list of the instruments most relevant to the work of EnDev and its wider CoP are included in this chapter. The tools listed were identified through a review of the literature, with a list of texts consulted included in Appendix I for further reading on energy access financing.

In line with the definition outlined in the previous chapter, no tool within this toolkit can be viewed as innovative on its own. A combination of tools is required to support a company along all stages of its growth journey, and every mechanism comes with drawbacks and challenges. Rather, innovation is found in the experimental ways that these tools are designed or combined to effectively and efficiently allocate capital and crowd additional finance into the space.

Figure 3.1: Financing tools for energy access by category

Traditional finance	**Grants**	Upfront CAPEX grants	Design-stage and non-recoverable cost grants	Convertible grants	Demand- side subsidies	Results- based financing
	Debt	Commercial debt	On-lending	Mezzanine debt	Convertible notes	
	Equity	Common stock		Preferred stock		
	Risk-sharing instruments	Loss-sharing mechanisms	Foreign exchange hedge		Revenue guarantees	
Alternative tools		Carbon finance	D-RECs	AssetCo Model	Receivables Financing	Anchor- based financing

3.1 Traditional financing tools for energy access

Energy access financing makes use of the same traditional financial instruments as other sectors, namely grants, debt, and equity. Risk-sharing instruments like guarantees can also be considered a more traditional tool of development finance that has proven applicable in the energy access space. To be effective, traditional finance mechanisms must be deployed alongside one another or in succession based on what is needed at specific stages of a company's growth and the innovation cycle for different products, with earlier stages requiring more concessional capital. Additionally, in more nascent or higher-risk markets, concessional capital must be deployed effectively to crowd in or pave the way for commercial capital. Oftentimes this is done via blended financing vehicles or through financing packages for specific companies.

3.1.1 Grants

Different forms of grants and subsidies have important roles to play in a market-based approach to achieving universal energy access. In particular, **design-stage and other comparable grants** are important for addressing the **non-recoverable costs of market development**, such as awareness campaigns, data collection, capacity-building, and feasibility studies. Non-return-seeking actors such as EnDev, for example, can use grant funding to implement pilot projects in the most nascent or highest-risk markets.

Companies also benefit from grant funding in the early stages of operations or to support the development of new products and innovations. **Up-front grants** to help cover capital costs are the most straightforward form of grant financing for companies. Donors also deploy **cost-of-capital grants** with conditions attached with the aim of improving performance. For example, **reimbursable grants** are only disbursed after companies spend money, while **matching grants** explicitly require a recipient to commit a share of their own capital. Some donors have provided **convertible grants** which become loans that companies repay if certain revenue levels are achieved, thus enabling the recycling of concessional funds and helping companies prove their ability to pay back debt.[10] EnDev is a leader in the development of **results-based financing (RBF)** and other **outcome-based grants**, which are disbursed to companies only after pre-agreed performance indicators are met and rigorously verified.[11]

Grant funding can also be disbursed as **demand-side subsidies** to customers directly or via companies and are used to increase the affordability of energy access for customers. They are provided as a reduction of costs for either energy (e.g. fuel or electricity) or an energy access product (e.g. cookstove, SHS, or mini-grid connection). These subsidies also support market development by rendering energy access technologies more cost-competitive and increasing the size of the total addressable market of customers, which in turn enhances companies' scaling potential.

10 GET.invest, "DOEN Foundation - Convertible Grants."
11 EnDev, "Transforming Energy Access Markets with Results-Based Financing."

Challenges and success factors

In a market-based approach to increasing energy access, it is essential to ensure that grants have a catalytic impact, setting up companies' transition to accessing finance on increasingly commercial terms. However, there are a number of important barriers to consider:

Challenge: There is always a risk that an oversupply of grant funding will crowd out private investors and that scarce concessional funding will be allocated away from areas where it is most needed.

Success factors: Grant-funded subsidies for companies should be designed with a clear plan for phase-out when certain milestones are achieved, such as increased accessibility to debt or equity at the company or sector level. Projects and subsidy programs should be designed with the explicit aim of facilitating these milestones, through the inclusion of features such as capacity-building support for companies or data collection and communication to de-risk the sector for commercial financiers.

Other considerations: Outcome-based criteria and verification of results can support company professionalisation and preparation for phase-out.

Challenge: Grant design can hinder companies' access to commercial finance or place additional burdens on companies seeking financing. Losing access to grant funding too soon can jeopardise companies' growth journey. Uncertainty around the conditionality and availability of results-based finance may also lead banks to refuse to view it as a reliable source of revenue to provide more favourable borrowing terms.[12]

Success factors: Designing grants with the concerns of lenders in mind can help bridge the gap to more commercial funding for companies. It is also important to balance the milestones and requirements for RBF with the capital needs of companies to avoid creating additional challenges in their financing journey.

Other considerations: Providing up-front grants with partial disbursal after incremental achievements can also reduce the need for companies to seek bridge financing to cover costs. This is particularly the case with technologies with higher start-up costs and longer routes to profitability, such as mini-grids.[13]
Challenge: Improperly implemented consumer subsidies can create market distortions that make it hard for companies to compete on more commercial terms and hinder progress on the long-term goal of market development.

Success factors: Consumer subsidies should be carefully targeted, and analysis should be conducted to determine whether longer repayment periods or other interventions could eliminate the need for subsidies. In situations where subsidies are necessary, aspirations for phase-out must be balanced with the importance of ensuring reliable access for marginalised groups.

Other considerations: Clear milestones, such as significant product cost reductions or increases in consumer incomes may trigger phase-out. EnDev is piloting innovative approaches in this area via its Demand-Side Subsidies Component in Liberia, Malawi, Nigeria and Uganda, and it conducts research on subsidy optimization via the End-User Subsidy Lab partnership.[14]

12 Bloomfield, "Renewable Energy Market Segments in Sub-Saharan Africa: Outlook & Challenges."

13 ESMAP, "Mini Grids for Half a Billion People: Market Outlook and Handbook for Decision Makers."

14 EnDev, "Demand-Side Subsidies (DSS)."

Figure 3.2: Primary granting tools for energy access

Instrument	Description	Providers	Examples
Upfront grants	Funding disbursed to a firm to cover capital and/or nonrecoverable expenses, with or without terms attached	• DFIs • Public financial agencies • National development institutions • Philanthropy	EnDev COVID-19 Relief Fund for the Solar and Cookstove Sector
Reimbursable grants	Funding disbursed after a firm has already spent money	• DFIs • Public financial agencies • National development institutions • Philanthropy	PowerAfrica Empowering East and Central Africa (EECA) initiative
Outcome/ results-based grants	Funding disbursed to companies upon meeting and rigorously verifying pre-agreed performance indicators	• DFIs • Public financial agencies • National development institutions • Philanthropy	EnDev RBF facility
Convertible grants	Funding that is repaid only if/ when certain milestones are reached	• DFIs • Public financial agencies • National development institutions • Philanthropy	DOEN Foundation convertible grants
Demand-side subsidies	Funding disbursed directly to consumers or via distributing companies to reduce a product's cost	• DFIs • Public financial agencies • National development institutions • Philanthropy	EnDev Demand-Side Subsidy Component

3.1.2 Debt

Commercial debt from traditional lenders at market rates is primarily accessible to a small number of companies across energy access market segments that have a demonstrated track record of profitability and have already achieved a certain level of scale. The road to profitability and scale can be long and full of setbacks, particularly for locally founded companies. These difficulties are compounded by the fact that many entrepreneurs do not have the experience or savvy to properly communicate their business model, track record, and plans; together, this leaves many energy access companies struggling to obtain affordable debt. Frequently, co-investment, risk-mitigation, or other support from concessional sources is needed to make debt available to more companies in the space. While these broad trends are present in the energy access market across geographies, it is crucial that stakeholders identify the specific barriers to debt financing and which of these barriers should be addressed by concessional capital versus those that are better addressed by technical assistance to either companies or lenders.

Regarding financing tools which can be used to unlock debt from commercial sources, concessional lenders can supply **credit lines** to governments or directly to local financial institutions which can be on-lent to companies under more flexible or affordable terms. Frequently, commercial and concessional financiers also participate in blended finance vehicles which enable senior debt to be combined with various forms of **subordinated debt**, which is repaid second, to reduce risk for commercial lenders. **Mezzanine debt** is a hybrid instrument which enables lenders to take a share of equity in a company once certain milestones are achieved, and **convertible notes** typically have a lower interest rates up front in exchange for a larger equity share provided later.

Challenges and success factors

Challenge: Companies often struggle to bridge the gap between grant funding and loans because they are not properly prepared to demonstrate profitability or supply the financial records required by lenders.

Success factors: Companies need support in becoming investment- and finance-ready and addressing the requirements of lenders. This can include capacity building and financial assistance related to challenges such as customer credit management, financial record keeping and sales.

Other considerations: Certain types of grant funding, such as RBF, can help companies professionalise and develop the skills and documentation needed to meet loan eligibility requirements.

Challenge: Lenders cannot offer the loan terms needed by companies due to internal constraints. For smaller, earlier-stage companies, there are few lenders offering small loans (under $100,000). Access to long-term debt and local currency financing remains limited, even for more mature companies seeking growth capital.

Success factors: Effectively designed on-lending structures, blended finance solutions and other innovative finance mechanisms can address financial institutions' internal constraints in order to offer loan terms more in line with company needs. Successful solutions to bridge these gaps largely depend on the context of the country, market, and technology market segment in question. For example, on-lending facilities may be appropriate in markets with a liquidity shortage but may cause market distortions elsewhere.

Other considerations: Limited access to long-term debt poses a particular challenge for mini-grid developers and PUE companies offering consumer financing for higher-cost productive assets, which have longer cash-conversion cycles.

Challenge: Lenders are often hesitant to engage with energy access companies due to higher risk perception and typical lower margins achieved in the sector.

Success factor: Targeted de-risking mechanisms coupled with technical assistance to help financial institutions better understand and standardise their approach to the sector can increase lenders' willingness to engage in the space over the short and long term.

Other considerations: Risk perception tied to OGS, clean cooking and PUE is compounded by the fact that companies typically bear the responsibility of providing financing to customers without credit history. Innovations to remove the responsibility of consumer finance from companies can increase their appeal to lenders. Collection and dissemination of data demonstrating companies' reliable operations and customers' reliable repayments can also contribute to lowering risk perception.

Figure 3.3: Primary debt financing tools for energy access

Instrument	Description	Lenders	Examples
Commercial debt	Funds offered directly to a company that must be paid back with interest to the lender	• Banks • Pension funds • Insurance companies	Demand Aggregation for Renewable Technology (DART) Africa Go Green Fund
On-lending	Funds offered on concessional terms to lenders to allow them to take on more risk and make impact investments	• DFIs • Governments • Local banks	Tanzanian Energy Development Access Programme (TEDAP)
Subordinated debt	Funds offered directly to a company that can be paid back to a concessional lender after others are paid back	• DFIs • Impact investors	Energy Transition and Access Facility for Africa
Mezzanine debt	Funds offered as a loan that, if and when certain milestones are met, can be repaid partially through equity shares	• Private equity companies • Venture capital companies • Impact investors	Spark+ Africa Fund
Convertible notes	Funds offered via an initially low-interest loan that can be repaid later as equity shares in the company	• Private equity companies • Venture capital companies • Impact investors	EDF's investment in Sun Culture ElectriFi's investment in VITALITE

3.1.4 Equity

Limited access to equity can hinder the growth of companies working across all market segments as well as overall market development. **Common stock** is the equity typically issued to the founders of a company, as well as family, friends, and early employees that devote money, time, and skills in the early stages of a business. This type of equity is typically used in conjunction with grant funding in a company's proof-of-concept stage. **Preferred stock** is typically issued to outside investors, from venture capital companies to impact investors to private equity companies. These investors receive proceeds before common stockholders and typically have certain additional rights related to company decision-making. Preferred stock is usually issued to finance company growth.

While outside equity investments are often essential to further growth of more mature companies, this financial tool is not always needed by or appropriate for smaller companies. In particular, distributors and other companies working across market segments with relatively lower capital expenditure and companies focused on serving a smaller, local market rather than rapid growth may not need equity and would likely struggle to meet the return expectations of outside investors. For the SDG 7 community, it will be important to identify appropriate investors and develop innovative financing solutions which channel equity to companies that require it due to their growth ambitions or business model. At the same time, many companies may rely on a combination of grant funding and debt financing for the duration of their lifetime.

Challenges and success factors

Challenge: The energy access sector in general faces a long route to profitability and more mature companies often have relatively slim profit margins due to the high cost of serving communities with limited ability to pay.

Success factors: Companies and development partners in the sector must identify investors willing to supply patient equity on an impact basis, meaning that they will accept a lower or more delayed financial return in recognition of a project's social and environmental impacts. Only more mature companies are likely to be able to meet the return expectations of standard private equity investors.

Other considerations: The deployment of concessional capital to mitigate risk and reduce transaction costs for both companies and investors can also help in attracting equity to the energy access space. A number of alternative tools which can improve the unit economics and balance sheets of companies can also improve their attractiveness to equity investors (see section 3.2).

Challenge: Even impact investors will not contribute equity to companies that have not demonstrated financial sustainability, including positive unit economics and scaling potential.

Success factors: Technical assistance to support companies in becoming investment ready by strengthening their business model, improving their financial management, and learning to pitch themselves to investors remains essential.

Other considerations: In order to attract impact investors, companies also need to be able to communicate about how they are improving the lives of their customers or communities.

Figure 3.4: Primary equity financing tools for energy access

Instrument	Description	Lenders	Examples
Common stock	Ownership shares given to founders or early employees and their close family/ friends at a company's earliest stage	Founders Early employees Family and friends	N/A
Preferred stock	Ownership shares given to outside investors that entitles them to proceeds before common stockholders	Private equity companies Venture capital companies Impact investors	N/A

3.1.5 Risk-sharing instruments

There are also a number of financial tools which can be deployed to mitigate specific risks for grant providers, lenders, and investors, such as political instability, demand uncertainty, and customer's ability to pay, by transferring them to a more risk-tolerant third party. While commercial financiers can provide risk-sharing instruments, they are generally reluctant to do so in developing countries where energy access gaps are the highest. Thus, guarantors in the energy access space are typically development finance institutions, special funds, philanthropic donors, or government entities.

Guarantees can be provided to investors, lenders, or companies directly. **Loss-sharing mechanisms** transfer some amount of risk for investors and lenders to a guarantor who absorbs a pre-agreed share of any losses from an investment. **Foreign exchange hedges** specifically address currency risk by locking in an exchange rate for investors and lenders and designating a third party to absorb any losses due to depreciation. However, they can increase the cost of a transaction and can be prohibitively expensive for small companies. In the mini-grid space, there has also been some experimentation more recently with **revenue guarantee schemes** traditionally used in financing transport infrastructure to reduce demand uncertainty risk.[15] Minimum revenue guarantees, for example, establish a predetermined minimum revenue for a mini-grid, with the guarantor covering any shortfalls.

15 CBEA, "Open Sourcing Infrastructure Finance for Mini-Grids."

Challenges and success factors

Challenge: Financial risk-sharing instruments can be particularly impactful for mitigating specific risks and crowding in additional capital to support energy access. However, they can be expensive and time consuming to execute. To sustainably reduce risk over the long term, efforts to enhance the enabling environment also remain crucial.

Success factors: Financial guarantees are best deployed in parallel with non-financial initiatives that help sustainably reduce risk, and therefore the need for financial risk mitigation increase, over time. Such initiatives can include technical assistance to aid data collection and communication; capacity building for companies, financiers and government stakeholders; and collaboration to enhance the policy, regulatory, and legal environment around energy access, among other efforts.

Other considerations: Long-term sustainable reduction of risk surrounding the energy access space is a collaborative effort, with governments, companies, financiers, and development partners all working in parallel to develop the enabling environment.

Instrument	Description	Providers	Examples
Loss-sharing mechanisms	Agreement under which a guarantor will absorb a certain amount of loss for lenders/investors	• DFIs • National development institutions • Governments • Export credit agencies • Private export guarantee funds	Green 4 Access First Loss Facility
Foreign exchange hedge	Agreement that locks in a specific exchange rate for lenders/investors, with a third party absorbing depreciation loss	• DFIs • National development institutions • Alternative investment funds	Currency Exchange Fund (TCX)
Revenue guarantee schemes	Agreement under which a guarantor maintains a minimum revenue for infrastructure like a mini-grid	• DFIs • National development institutions • Governments • Export credit agencies	Green Aggregation Tech Enterprise (GATE)

3.2 Emerging tools

Over time, a number of other mechanisms outside the scope of traditional financial instruments have shown potential to improve the unit economics of energy access businesses and catalyse additional capital across market segments. Some of these tools have been previously applied in other sectors, while others are fit-for-purpose to energy access. Their novelty in the space relates to the "experimentation" pillar of the definition of innovative finance developed in Chapter 2. However, it is important to emphasise that these emerging tools are not "silver bullets" for solving the challenge of access to finance for companies. They are complementary solutions which can be used in tandem with traditional instruments to effectively and efficiently allocate capital and crowd in finance from new sources.

In most cases, in the absence of support from development partners, companies need to have achieved a significant level of scale or already have access to substantial traditional finance to incorporate these tools into their projects. Unlike with traditional financing instruments, which are generally applicable across all market segments, some of these tools have greater applicability for some technologies than others.

3.2.1 Carbon finance and D-RECs

Carbon finance monetises the emissions reductions from customers switching to low-carbon energy access technologies in place of more polluting methods, such as cooking with charcoal or running generators on diesel.[16] Carbon credits are generated when developers verify the greenhouse gas reduction achieved from baseline levels. The credits are then sold primarily on voluntary carbon markets, with the revenue used to cover company operating costs or subsidise costs for end-users.[17] Revenues generated beyond break even can be used to support company growth or directed back to communities under a benefits-sharing plan. Credits can also be pre-sold to dedicated off takers, in which case carbon revenues can help to cover companies' up-front costs. Because carbon crediting projects are expensive and time-consuming to set up, this tool is primarily available to companies that have already achieved a significant degree of scale.

To date, carbon finance has been particularly impactful in the clean cooking space, where it has enabled some companies to address a significantly larger market, achieve greater scale, and attract new investment. Carbon finance has so far been less impactful for OGS technologies, primarily due to the price of these technologies being relatively high compared to the quantity of emissions offset by their use. However, partnerships are beginning to emerge in this space.[18]

Furthermore, while this tool has proven transformative for some, there are important challenges to be addressed in order to maximise its impact for energy access and climate action more broadly. Legitimate concerns over the market's transparency and the validity of credits have been raised, and the sense that polluters are using carbon credits in lieu of investing in systemic change has led to a push for more meaningful evaluation of carbon credits and their effects beyond emission reduction.[19] Development partners have a role to play here both by supporting more rigorous reporting and validation and by increasing smaller companies' capacity to meet those requirements. EnDev has incorporated carbon crediting in several of its global projects, for example working with AVSI to help families sell carbon credits to directly reduce the cost of improved cookstoves in Mozambique.[20] Initiatives like this also address the criticism that carbon markets fail to include the actual end users whose activities are generating the credits.

Established in 2021 by carbon market pioneer South Pole and a coalition of partners, the **Distributed Renewable Energy Certificates (D-RECs)** pilot aims to create a global market where companies can purchase verified renewable energy certificates (RECs) from decentralised sources to meet decarbonisation commitments. RECs are already widely available and used to support the financing of grid-connected renewables in several countries; D-RECs expand this concept to decentralised assets, particularly OGS, PUE, and mini-grids, adding a new revenue stream for developers of these technologies. EnDev, on behalf of GIZ's DeveloPPP programme, serves as a member of the steering committee of the D-REC Initiative.

3.2.2 Aggregation

Aggregation refers to bundling small-scale energy access projects together into portfolios of assets to achieve economies of scale. Aggregation provides a number of cost-saving benefits for

16 EnDev, "Voluntary Carbon for Energy Access."
17 Wharton et al., "Carbon Finance Playbook: Demystifying the Capital Raising Process for Nature-Based Carbon Projects in Emerging Markets."
18 Mahoney, "What Drives Demand for Off-Grid Solar Carbon Credits?"
19 Carbon Clear and Power Africa. "Carbon Credits for Off-Grid Solar in Sub-Saharan Africa: Lessons from Energy-Access Companies in the Voluntary Carbon-Credit Market."
20 AVSI, "Carbon Credits."

companies, making it possible to standardise and centralise certain business functions, and also creates larger ticket investments that will appeal to certain capital providers. However, the ability to pursue this strategy largely depends on access to growth capital. A policy and regulatory environment that facilitates standardisation is also key to fostering aggregation.

Financial aggregation is an important tool for growing energy access markets. Financial assets of energy access businesses—typically the future cash flows embodied in receivables for PAYGO-supported clean cooking, OGS, and PUE companies and physical energy assets for mini-grid and commercial and industrial (C&I) solar developers—can be pooled and **securitised**.[21] These securities can then be presented to lenders as collateral or to investors as demonstration of future revenues. Securities can also be placed into an **off-balance sheet structure**, usually a special purpose vehicle (SPV), removing the associated risk from the company's balance sheet, and sold to investors to raise working capital. Securitisation and off-balance sheet financing have the particular appeal of transforming consumer debt burden from a hindrance to distributors' access to credit to a source of financing. However, these complex financial transactions are expensive and time consuming to execute, and they require a sizable pool of assets to bundle.

Operational aggregation for project-based market segments, such as mini-grids, can also be achieved through the sale of completed projects to an **AssetCo**.[22] In this approach, a developer (or DevCo), owns a project during development and construction and then sells it to an AssetCo once completed. The AssetCo then signs operations and maintenance contracts with the original developer or another company. This arrangement ring-fences the assets, clearly delineating risks for investors who otherwise may see infrastructure like mini-grids as too risky.[23] This approach also eliminates the burden for developers of having to take on the costly and resource-intensive responsibility of operating as a mini-utility. Multiple AssetCos can be pooled into a larger holding company (HoldCo), creating larger ticket size investments that make it possible to raise financing from new sources. CrossBoundary Energy Access is piloting an AssetCo securitisation model with mini-grids in Nigeria, Zambia, and Tanzania, operating at multiple levels of aggregation.[24]

An increase in the use of aggregation and consolidation will be key to scaling up energy access market segments globally, given the strategy's ability to manage risk in a way that avoids prohibitively high capital costs or overreliance on grants and subsidies.[25] However, securitisation will continue to favour international or hybrid companies that already have greater access to finance.[26] Development partners and governments have a role to play in ensuring that the benefits of aggregation-related tools are made accessible to smaller players and that their use by scale-ups does not block market entry for newer local players.

3.2.3 Anchor-based financing

Anchor-based financing has long been used to support the development of mini-grids. Essentially, it involves identifying one or multiple anchor customers, usually a telecom tower, agri-processing business, or factory, with sufficient potential load to account for a substantial amount of power generated by a mini-grid. This approach addresses the demand uncertainty risk associated with mini-grids and can reduce the need for grant support in project development. There is significant potential for further innovation around anchor-based financing. For example, some actors have called for development stakeholders to design projects to stimulate PUE in parallel with mini-grid development in order to support rural industrialisation and optimise system design.[27]

An innovative variation on the anchor-based financing approach that has emerged in recent years is the use of excess generation from mini-grids to support high-consumption technology uses, such as cryptocurrency mining. German consulting and engineering firm INENSUS GmbH has tested using excess generation for solar mini-grids to mine bitcoin,[28] while others like BitHub Africa used blockchain technology to generate digital tokens which store excess energy and can be traded on peer-to-peer energy markets.[29] While such projects are primarily in the pilot stage to date, they present an interesting opportunity to reduce demand uncertainty for mini-grid projects, eliminate the need for diesel backup power, and potentially provide additional revenue streams for communities and companies from the trading of digital tokens.

21 UN Development Programme and GEF, "Mainstreaming Financial Aggregation for Distributed Renewable Energy."
22 CBEA, "Open Sourcing Infrastructure Finance for Mini-Grids."
23 IRENA, "Unlocking Renewable Energy Investment: The Role of Risk Mitigation and Structured Finance."
24 CBEA, "Open Sourcing Infrastructure Finance for Mini-Grids."
25 Bloomfield, "Renewable Energy Market Segments in Sub-Saharan Africa."
26 ESMAP. "Mini Grids for Half a Billion People."
27 Bloomfield, "Renewable Energy Market Segments in Sub-Saharan Africa."
28 AFSIA, "Green Bitcoin Mining."
29 Hivos, "Solar Block-Chain Technology for Climate Justice."

Instrument	Description	Providers	Example
Carbon finance	Energy access companies verify the emissions reductions caused by their products and sell credits for those to firms looking to meet emissions caps or ESG goals	• Companies • Independent monitoring/evaluation organisations	SunCulture Fair Climate Fund West Africa Biodigester Programme of Activities
D-RECs	Energy access companies sell certificates representing renewable energy generation that can be sold to companies looking to meet emissions caps or ESG goals	• Power providers	Alina Eneji
Aggregation	Assets or receivables from various initiatives or companies are combined into an SPV to be sold to investors	• Non-bank financial institutions • DFIs • Alternative investment funds • Impact investors	UNDP's Climate Aggregation Platform
AssetCo models	An investor agrees to purchase portfolio of energy access assets from a developer once certain milestones are met	• Non-bank financial institutions • DFIs • Alternative investment funds • Impact investors	Cross-Boundary Energy Access (CBEA)
Anchor-based financing	A high-demand energy consumer signs a contract to purchase power to ensure some minimum demand for a renewable energy asset	• Industrial/commercial power purchasers	BitHub Africa / Melanin Solar Vol-Terra Farm and Energy Solutions Limited
Securitization / off-balance-sheet financing	Assets (or receivables) are sold to an SPV to protect them from other creditors' claims, that SPV then creates distinct securities to be marketed to investors with differing risk tolerances	• Non-bank financial institutions • DFIs • Alternative investment funds • Impact investors	Oikocredit and BBOXX

4 Trends in Innovative Finance

As outlined in Chapter 3, both traditional and emerging tools are still primarily accessible in more developed markets or to larger, more mature companies. There remains a particular need for innovation for the kind of companies EnDev works most closely with, namely SMEs in the earlier stages of development, smaller companies, or locally owned SMEs that are not focused on rapid growth.

Surveys were conducted with EnDev's community of practice to identify trends within energy access financing which they saw as innovative for the companies they work with; this was supplemented with a review of the literature on challenges to financing energy access. The definition of innovative finance developed in Chapter 2 was then applied to a longlist of innovative trends identified, and four were selected for further exploration in interactive workshops based on their relevance to EnDev's work and the learning goals of the CoP. This chapter presents the learnings from that exploration. The first subsection examines more closely the financing needs and journeys of energy access SMEs to highlight where innovation is most needed. The remaining subsections explore trends that have potential for unlocking the finance needed to support these SMEs, identifying the barriers that must be overcome and the potential solutions that international development stakeholders within the SDG 7 community can pursue to unlock their promise.

4.1 SME access to innovative finance

Figure 4.1: SME finance and the innovative finance pillars

Experimentation	Innovative solutions to SME financing come from **developing new blended finance mechanisms** and **applying traditional tools in new contexts**, while entrepreneurs themselves **learn on the job how to access various types of commercial financing**.
Efficiency and effectiveness	The key to funding SMEs is **providing financing in the right ticket size** and **at the right time** to meet their needs for operations and growth.
Mobilising effect	Securing financing has a **snowball effect for SME**s: each investment secured is an opportunity that can be **leveraged to unlock more commercial capital**.

Small companies, often with local or hybrid ownership, have an important role to play in solving the energy access challenge. These companies have the ability to act with more agility and adjust their operations to specific local contexts. They also play an important role in local job creation [30] Research on last-mile distributors (LMDs), an important subset of energy access SMEs, has found that slower growing companies in this category often return more profit per unit of investment.[31]

Yet despite their contributions, these companies face high barriers in accessing finance and receive less investment than faster-growing peers with stronger international ties. Even as innovative financing solutions are being developed for the energy access space at large, many of the tools that have gained significant attention in recent years remain out of reach for this category of entrepreneur unless support to unlock them is provided by development partners. Several experts consulted during this research process emphasised the pressing need for more work to connect such companies with the emerging financing tools that have the power to catalyse more investment and expand energy access.

At each stage of a company's growth journey, from proof-of-concept to mature operations and expansion, companies require different types of financing. The stages of this journey, key challenges encountered at each, and financial tools needed are summarised in Figure 4.2. Companies particularly struggle to cross the "valleys of death" between each of these stages, moving from more concessional capital to commercial financing. The bridge to accessing initial debt and equity is particularly challenging, as companies need flexible terms from both grant providers and initial commercial lenders and investors, but those terms are hard to secure. It is also challenging for earlier-stage companies to find commercial capital in the small quantities initially needed to support their growth.

Figure 4.2: Differing needs along the company growth journey[32]

	Proof-of-concept*	Early operations	Growth	Mature
Description	Companies are researching and developing their product and business plan	Companies are developing their customer base and trying to maintain inventory	Companies are growing their market share and building internal operational capacity	Companies may choose to expand into new geographies or product categories
Challenges	Founders do not have collateral to access debt and often lack skills to pitch their idea to investors.	Companies have high working capital needs to keep up inventory and operations, and do not have sufficient credit history or demonstrated profitability to access debt.	High risk perception drives up the cost of capital, and companies offering consumer credit have receivables-heavy balance sheets.	Transaction costs and risk perception remain high, and the pool of potential investors remains small
Appropriate tools for companies	• Founders equity • Common stock • R&D grants	• Targeted grants • Small-ticket size loans • Venture equity • Short-term debt	• Small-ticket size loans • Impact debt/equity • Mezzanine debt	• Private equity • Long-term debt

*Mini-grid developers' growth journey face greater financing challenges early on in their journey (proof-of-concept/early operations) due to the higher CAPEX requirements of project-based business models and longer route to profitability.

30 Böck, Stolz, and von Koschitzky-Kimani, "Learnings from a Decade of Investing in Energy Access in Africa."
31 Global Distributors Collective, "The Growth and Fundraising Journeys of Last Mile Distributors (LMDs)."
32 Economic Consulting Associates Limited, "Benchmarking Africa's Minigrids Report 2022."; Global Distributors Collective, "The Growth and Fundraising Journeys of Last Mile Distributors (LMDs)."

Within the energy access puzzle, LMDs face particular obstacles to accessing finance that set them apart from companies earlier on in the value chain. Because LMDs often must sell on credit, their balance sheets are particularly unattractive to investors, and it is difficult to time financing with inventory needs. Accessing finance is cited by the majority of LMD companies as the single biggest operational challenge they face; the problem is even more prevalent among smaller distributors.[33]

While the specific financing needs and opportunities vary across market segments and stages of company growth, the research has identified several broad challenges that SMEs across the energy access space face when trying to access financing during these initial growth transitions:

- **Investment readiness:** SMEs often lack the know-how to access initial commercial finance from lenders and investors. They may struggle to identify appropriate sources of finance, pitch themselves to prospective funders, demonstrate the profitability of their business model and growth strategy, evaluate financing offers, and negotiate terms.

- **Ticket size**: Energy access SMEs need relatively small tranches of capital to match their operational size. Companies often struggle to find investors or lenders with small enough ticket sizes, as commercial capital providers generally cannot justify the transaction costs for the amount of financing needed by companies.

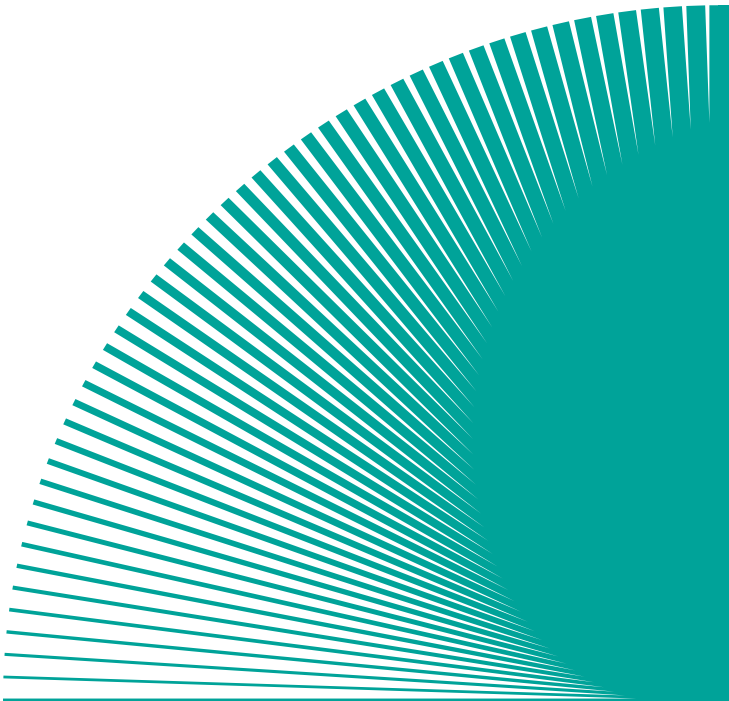
- **Heightened risk perception**: SMEs must overcome investors' perception of energy access as high-risk. This perception is compounded for emerging companies that do not have an established track record or those that serve the most rural or hardest to reach populations, many of which are smaller and locally owned.

- **Due diligence burden**: Investors often require a rigorous due diligence process that can be prohibitively burdensome for energy access SMEs. Early-stage companies may not have experience with the type of financial reporting or other work required, and small companies often lack dedicated staff for such reporting.

- **(Dis)continuity of finance**: In the energy access space, much of the concessional capital that is essential for small companies is disbursed via development partnerships under specific projects with discrete goals and finite timeline. SMEs, however, need continuous finance to operate and grow over time. This mismatch in the approach of concessional partners and the needs of companies can place additional burdens on companies as they patch together financing from different sources to foster their growth.

- **Lack of local currency financing:** Limited access to local currency financing from either domestic or international sources leaves many companies reliant on hard currency debt to fund their operations. As a result, currency depreciation and volatility can pose significant financial challenges for companies. A lack of accessible financing from domestic sources also poses an additional challenge for local companies which often face greater barriers to accessing financing from international sources.

There are no simple, one-size-fits-all solutions to any of these challenges. Any start-up in any market must always piece together funding from various sources. For energy access SMEs, this process is even more difficult due to the challenges inherent in the sector and the markets where they operate. Given this reality, development partners such as EnDev and its broader community of practitioners and partners have important roles to play in developing financial innovations to close the finance gap for these companies, making recent innovations and alternative tools more accessible to smaller and local companies, and providing the concessional funding and technical assistance to bridge the gap between these companies and commercial lenders and investors. The following subsections of Chapter 4 explore key financing innovations where development partners can make an impact to address these challenges.



33 Global Distributors Collective, "Last Mile Distribution: State of the Sector Update 2022."

Case study: Innovative financing in practice

Tailoring funds to the needs of LMDs: SIMA's Emerging Distributors' Finance Fund

SIMA is a funder working to address the specific financing challenges faced by LMDs and local companies through its Emerging Distributors Finance Fund (EDFF) and Energy Access Relief Fund (EARF). The EDFF, which uses data tracking to develop a credit scorecard for small- to medium-sized distributors, has so far provided around $8m in debt to around 20 companies chosen from around 200 applicants. Launched in 2020, the EDFF struggled to find enough investees that matched its initial criteria, highlighting the difficulty of finding adequate pipeline for specifically targeted funds. Even after the EDFF lowered its loan size from $500,000-$1,000,000 to $50,000-$250,000, many applicants were disqualified for needing smaller amounts, sometimes as little as $20,000, underscoring just how much demand there is for small-ticket size loans. SIMA also expanded the EDFF from its initial focus on SHS and clean cooking to include PUE companies, which often have stronger revenue potential. After initially only using the Angaza data platform to create credit scorecards for companies, it began using other platforms in 2022 in order to expand the number of potential companies.

No one solution: Winock Solar's financing journey

Winock Solar in Nigeria has combined different financing tools in order to build off of early successes and unlock more commercial finance over time; this success story shows the ideal path of a locally founded energy access SME. Launched in 2017 with around $30,000 in founder savings, it survived its first year with $100,000 in angel investment before securing around GBP 8,000 in unsecured debt from Charm Impact in 2019. The following year, Winock secured $265,000 from the climate fintech firm Nithio. From 2021 until now, Winock has been able to secure both debt and equity investments as large as $1 million from various sources. Among the challenges faced along the way were forex risk, high interest rates, and the lack of grants available to companies that, like Winock, distribute but do not develop their own products Winock's story is a clear example of how SMEs patch together financing from different opportunities based both on their needs and what is available to them. Innovative finance does not mean finding one solution for these companies; instead, innovation serves to create more financing options and remove barriers to accessing financing.

4.2 Crowdfunding: Unlocking smaller ticket sizes and mobilising more capital

Crowdfunding platforms are an emerging way for companies to access debt (and to a lesser extent, equity) in smaller ticket sizes, which is particularly important for SMEs. By giving retail investors the opportunity to contribute to companies' fundraising campaigns, crowdfunding also brings new funders into the space.

Figure 4.3: Crowdfunding and the innovative finance pillars

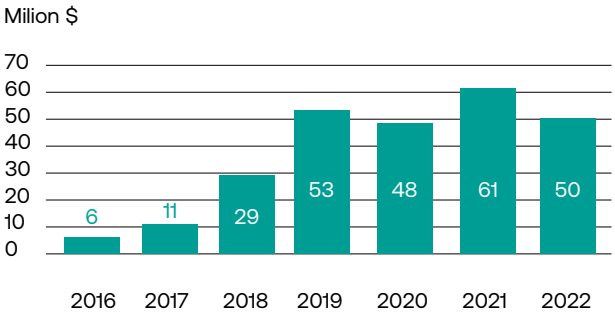
Experimentation	Crowdfunding is a **relatively new, digitally enabled** tool to get finance to those who need it.
Efficiency and effectiveness	Crowdfunding helps companies **raise money faster** in **smaller, more appropriate** ticket sizes, and with **lower transaction costs.**
Mobilising effect	Crowdfunding provides **opportunities for retail investors** to support energy access. Donors and strategic partners can also **co-invest** and provide other **support to unlock additional capital**.

A number of digital innovations, including in the financial space, have emerged in recent years that have been transformative in scaling energy access. These are explored in depth in the companion knowledge product for this Learning & Innovation Cycle. Crowdfunding, was selected for further examination here because of the important role these platforms have begun to play in providing timely funding for smaller energy access companies, including those at earlier stages of their growth journey, who need smaller amounts of financing.

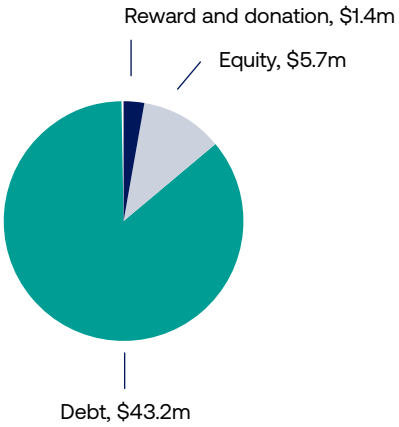
Crowdfunding is not a distinct type of financing but rather a digitally enabled solution that uses online platforms to pool small investments from many contributors, allowing companies to access smaller quantities of funding from a broader base of potential funders. From 2016 to 2022, some $258m was invested in energy access via crowdfunding.[34]

34 Petex, Cogan, and Weston, "Crowdfunding Energy Access: State of the Market Report 2022."

Figures 4.4 and 4.5: Crowdfunding raised for energy access 2016-22[35]



Crowdfunding raised for energy access by instrument, 2022



Crowdfunding platforms can be used to raise debt, equity or donations but primarily has been a tool for energy access companies to raise debt. The average ticket size of debt crowdfunding campaigns for energy access in 2021 ranged from $85,000-$754,000.[36] Among LMD companies that are members of the Global Distributors Collective (GDC), crowdfunding has grown to become the most common source of debt.[37]

Companies across all energy access market segments have used crowdfunding, but this tool has proven most accessible for OGS and PUE companies whose cash-conversion cycles align more naturally with crowdfunders' preference for full repayment within three years. Mini-grid developers, in contrast, generally require longer-term financing. While clean cooking companies have raised significant funding via crowdfunding platforms, $8 million between 2015 and 2020, the higher risk perception of this market segment can deter investors.

Crowdfunding involves three main parties: businesses, funders, and platforms. The platform plays the key role of connecting potential funders to businesses; in most cases, funders can offer money towards a firm's investment goal, and if and when that goal is reached, the money is transferred. The platform also curates the pipeline of crowdfunding projects: it screens potential companies and determines their risk level, setting the terms of the investment. One of the most innovative elements of crowdfunding is that it engages a new category of investors—individual retail investors—in financing energy access. Yet crowdfunding platforms can also serve as a tool for crowding in funding from other sources, from philanthropic donors to impact investors to institutional investors.

Increasing participation from other funders with different risk and return expectations will be key to expanding the utility of these platforms for more market segments and companies. . To reach customers which are higher risk, require longer tenors, or need very small loans (under $500,000), crowdfunding platforms need support from partners with access to concessional finance. For example, Charm Impact offers very small ticket size loans and focuses on providing access to finance for locally owned and women-led SMEs. After discovering that the demand for its loans far exceeded the funding which could be raised from retail investors, the platform set out to raise additional funding from institutional investors via different blended finance mechanisms to complement what is supplied from the traditional crowd.

Rising interest rates, currency depreciation in developing countries and a series of high-profile defaults among energy access companies contributed to a decline in crowdfunding volumes raised in 2022 and has caused some platforms to shift away from the space.[38] These challenges increases the need for partnerships to de-risk investments, support the due diligence costs of platforms, and ensure that crowdfunding remains an affordable tool for energy access companies.

The following table outlines some of the challenges to making crowdfunding a broadly viable option for the sector.

35 Ibid.
36 Cogan et al., "Crowdfunding Energy Access: State of the Market Report 2021-22."
37 Global Distributors Collective, "Last Mile Distribution: State of the Sector Update 2022."
38 Petex et al., "Crowdfunding Energy Access."

Figure 4.6: Barriers to expanding access to crowdfunding for energy access and potential solutions

Barrier	Description	Solutions
Loan ticket size and duration	• Demand for small ticket size loans raised via crowdfunding still far outpaces supply • Repayment preferences of crowdfunders may not align with longer-term financing needs of some market segments (e.g. mini-grids, PUE)	• Concessional finance raised via blended financing vehicles to supplement funds raised from traditional retail investor crowd
Restricted access for local companies	• Crowdfunding platforms are less accessible for locally owned energy access companies	• Partnerships between development partners to direct investment-read companies to platforms • Enabling environment support to unlock equity crowdfunding access in developing countries
Lack of investible company pipeline	• There are more willing crowdfunders than companies that have been vetted and approved for inclusion on crowdfunding platforms	• Capacity-building support (possibly run via crowdfunding platforms) to enhance investment readiness ahead of campaign launch • Financial support from concessional actors to cover platform origination and due diligence costs
Rising costs of crowdfunding	• Interest rate increases, currency depreciation, and heightened risk perceptions of the sector have increased crowdfunding costs for energy access companies	• Provision of risk guarantees and other innovative risk-mitigation solutions from concessional sources • Blended finance partnerships to enable local currency crowdfunding

Case study: Crowdfunding in action

Crowdfunding for greater access to finance: SEE-Clean Cooking SME Finance Facilitator

The SME Finance Facilitator is an innovative initiative developed by RVO that demonstrates how development partners can leverage crowdfunding schemes to provide greater access to finance for clean cooking SMEs. This was piloted first under the Strengthening the Entrepreneurial Ecosystem for Clean Cooking (SEE-Clean Cooking) programme, associated to the EnDev partnership. RVO provided financial support to three crowdlending companies (Charm Impact, Energise Africa and Bettervest) to cover parts of the transaction costs to build up a portfolio with no less than 8 loans within two years. The funding was used for staff and third party costs, due diligence, and Know Your Customer (KYC) processes for loans that provide insufficient margin and could otherwise not be recovered. Covering a maximum of half of the transaction costs of the portfolio, making sure that crowdfunders have sufficient own contribution.

The initiative is designed to provide loans to support local African clean cooking companies often having difficulties obtaining necessary growth/ working capital to scale. The first of three trajectories started with Charm Impact beginning of 2022. With RVO's support, Charm Impact has been able to expand into the clean cooking sector. Charm Impact launched nine loans with a combined value of £845,550 across six companies. Two companies have already been able to obtain follow-on funding due to their strong performance on the first loan. A similar cooperation will be further applied to the wider EnDev core portfolio.

4.3 Local currency financing: Managing risk and engaging local financial systems

Local currency volatility and depreciations in recent years have put financial pressure on emerging energy access companies that are often reliant on hard currency debt to finance their operations. Innovative approaches to unlock local currency financing can reduce risks for companies and help introduce local lenders to energy access as a sector.

Figure 4.7 Local currency financing and the Innovative Finance Pillars

Experimentation	Innovators are **adapting traditional tools** and **tweaking strategies** to expand local currency financing to provide tailored support for energy access in different contexts
Efficiency and effectiveness	Expanding local currency financing access **increases participation of local financial institutions** and helps **build a more resilient energy access sector**
Mobilising effect	Partnerships to expand local currency financing can **attract new partners** to fund energy access, such as local banks and institutional investors

Greater access to local currency financing reduces companies' exposure to the exchange rate volatility, depreciation risk, and convertibility risk of hard currency debt. This risk can also be diminished through the use of a hedge, though such instruments can be expensive for small companies and challenging to implement in markets with illiquid currencies. Increasing access to local currency debt can contribute to companies' financial stability and support the development of more resilient markets for energy access. Companies across energy access market segments cite limited access to local currency financing as a key financial challenge. Access to local currency debt is particularly important for LMDs, which provide consumer financing and have multi-year cash-conversion cycles.[39]

Both international and local actors can unlock local currency financing for energy access. Development actors such as The Currency Exchange (TCX) Fund and GuarantCo provide hedges or guarantees that make international debt more predictable and manageable, enabling DFIs, investors, and other funders located outside of a country to lend in local currency. Such innovative solutions are particularly important in contexts where local currency financing from domestic sources is unavailable or prohibitively expensive. All energy access market segments have the potential to benefit from financing made available through such structures, and tenor can be tailored to segment and firm needs.

39 Global Distributors Collective, "The Growth and Fundraising Journeys of Last Mile Distributors (LMDs)."

Domestic financial institutions and institutional investors can also supply local currency financing. Engaging these actors has further benefits like crowding in new local capital to help close the energy access financing gap. However, unlocking financing from domestic sources can be challenging. Local lenders may be unwilling to lend to energy access companies or only willing to do so with prohibitively high interest rates or collateral requirements. While the determining factors vary from country to country, common threads are a lack of familiarity with the market segments and business models, regulatory uncertainty, and the availability of more appealing alternative investments.[40] Local banks often have limited access to long-term funds, making it difficult for them to provide the medium- and long-term financing needed by mini-grid developers and, in some cases, for PUE.[41]

Innovative pilots and initiatives are underway to address these issues through a combination of guarantees to de-risk the loans for local financial institutions and technical assistance to help them standardize their approach to energy access companies. However, even when these initiatives succeed in making local currency financing available to companies, the terms produced may not represent the most affordable option when compared to loans provided by international lenders.

To date, pilots have mainly benefitted more established energy access companies, as the creditworthiness of initial borrowers is key when engaging cautious local financial institutions in lending to a new asset class. As the mini-grid and OGS segments have begun to mature, there have been increased efforts to unlock local currency financing to fuel their next phase of growth. Providing this financing for clean cooking companies has proven more challenging, in part because few companies are sufficiently mature to access debt on commercial terms.[42] EnDev's Micro-Hydro Debt Fund, which provides local currency loans for cooperative-owned micro-hydropower projects in Nepal, has also faced challenges due to the mismatch in repayment expectations and capabilities between local banks and cooperatives.[43]

These efforts to de-risk energy access market segments for local financial institutions may have a longer-term impact of increasing their ability to lend to smaller and newer companies once they are ready to access debt. Greater access to domestic lenders and investors can make companies less vulnerable to shifts in the priorities and risk appetite of international capital providers. The ability to seek affordable loans directly from domestic banks could also prove transformative for local companies, which often face greater barriers to international finance.

Despite the challenges, unlocking local currency financing from domestic sources will be crucial for supporting continued growth and enhancing the resilience of energy access markets. As such, a summary of key challenges and possible solutions is provided below:

40 The African Development Bank, "Exploring the Role of Guarantee Products in Supporting Local Currency Financing of Sustainable Off-Grid Energy Projects in Africa."
41 ESMAP, "Mini Grids for Half a Billion People,"
42 Accenture, "Financing Growth in the Clean Cookstoves and Fuels Market: An Analysis and Recommendations."
43 Energypedia, "An Overview on Micro Hydro Debt Fund."

Figure 4.8 Challenges and solutions to unlock local currency financing for energy access

Barrier	Description	Solutions
High risk perception	Financial institutions are unfamiliar with energy access, and so overestimate risk across the sector	• Risk guarantees, collateral provision, or co-investment from concessional sources to increase financial institutions' comfort in lending to this alternative asset class • Technical assistance and capacity building to support financial institutions in understanding, assessing, and standardising their approach to energy access market segments
Loan affordability	Where local currency financing from local lenders is available, interest rates or collateral requirements may be prohibitively high	• Identifying more mature companies and market segments with greater demonstrated profitability and ability to take on higher-cost capital • Provision of first-loss collateral from concessional sources • Subsidies to reduce company and project costs in other areas
Lack of company pipeline	Market may lack enough companies with sufficient profitability and scale to take on commercial debt from local financial institutions	• Financial capacity building for companies to prepare them to demonstrate profitability and meet local lending requirements • Collaboration with local banks to assess suitable customers from within their existing portfolios

Case study: Local currency financing in the energy access sector

Consumer finance in local currency: Green4Access

The Green4Access (G4A) is a risk mitigation and technical assistance facility, which partners with local lenders to scale consumer lending for energy access and PUE, including e-mobility. Developed by GreenMax Capital Group with the support of CLASP and initial funding from P4G and the Ikea Foundation, G4A leverages the liquidity of local banks and non-bank financial institutions to provide affordable loans and other critical financial services to end-consumers. This approach aims to remove consumer debt from promising energy access companies' balance sheets, enhancing their profitability and potential to scale. G4A provides first-loss protection for up to 20% of a portfolio of end-user loans held by a financial institution. This protection is deposited as cash with the partner financial institution. Technical assistance is provided to help partners better understand the energy access space and identify a pipeline of companies to support. The initiative targets companies with existing portfolios of vetted end-users which can then be taken over by partner financial institutions. The pilot phase of G4A will consist of six portfolios implemented with partner lenders in Kenya, Malawi, Nigeria, Tanzania, and Uganda. Over the long-term, the fund aims to raise $50 million and unlock $1 billion in climate finance from local financial institutions to catalyse the adoption of climate smart technologies in Africa.

Local currency finance in fragile markets: Smart Power Myanmar

In a market where many international investors and lenders are wary of operating, Smart Power Myanmar (SPM), with support from the Global Energy Alliance for People and Planet (GEAPP), aims to catalyse the liquidity glut faced by Myanmar's local banks to provide affordable C&I solar financing for SMEs. Working with selected partner banks, SPM provides a risk guarantee to make banks comfortable providing loans. It also provides technical assistance to support banks in understanding solar as an asset class and build capacity to assess technical risks, conduct due diligence, structure loans, and assure quality in these projects. Over time, it has been possible to reduce the guarantee offered on each loan from 100% to as low as 20% as local banks have grown more comfortable with the distributed solar space. The project focuses on identifying credit-worthy SMEs serving as a link between businesses such as agri-processing, which play a key link in food supply chains and local employment. SPM seeks to enable any SME to walk into a local bank and obtain an affordable loan for a distributed solar system to compensate for weak or absent grid supply, and reduce reliance on pricey and polluting diesel backup power."

4.4 Climate finance: Unlocking capital at the intersection of SDG 7 and SDG 13

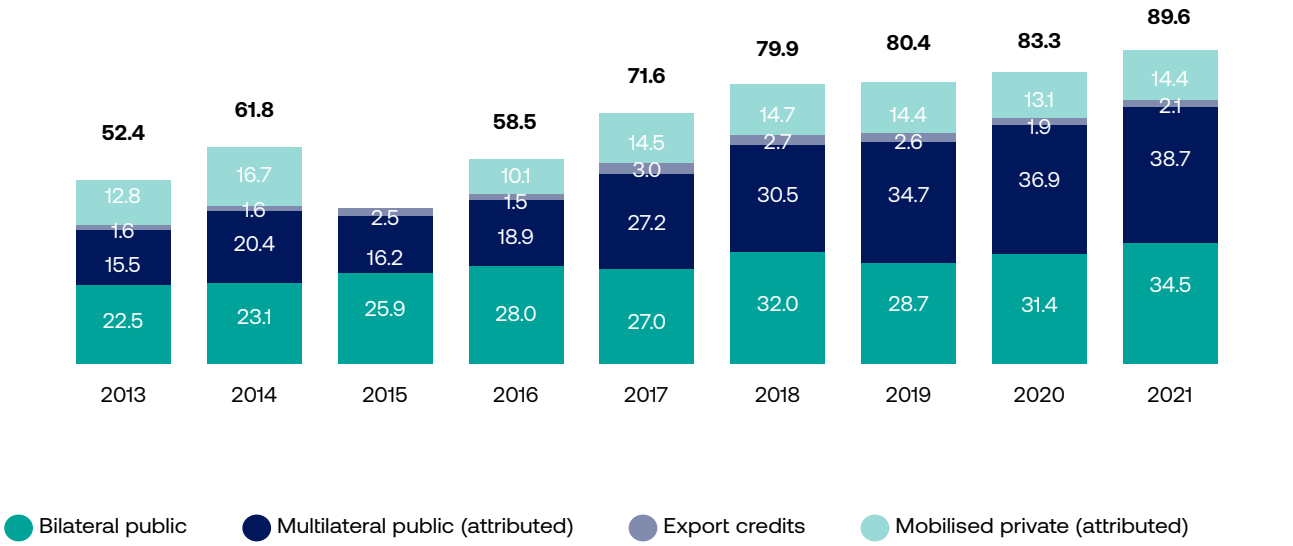
Along their growth journeys, energy access SMEs need more concessional funding to support their early growth and the development of new products. The donors and impact investors that typically supply this funding are increasingly prioritising investments which have a demonstrated climate impact. Thus, strengthening the link between achieving universal energy access (SDG 7) and combating climate change and its impacts (SDG13) will be important to ensuring continued funding for the former goal. It can also help to expedite the achievement of both.

Climate finance refers to the growing portion of public and private funding allocated to support climate mitigation, adaptation, and resilience. According to figures tracked by the OECD, over 80% of the climate finance allocated to developing countries comes from public sources. Around 60% of all funding committed, both public and private, is concessional debt, with another 30% in the form of grants, and equity and other instruments making up the remaining share.[45] In 2021, around 60% of climate finance for developing countries went toward mitigation, while 27% flowed to adaptation, and 13% to cross-cutting initiatives.

Figure 4.9 Climate finance and the innovative finance pillars

Experimentation	Climate finance is a **new category of finance**, and its relationship with energy access is still being defined through **innovative partnerships and pilots**
Efficiency and effectiveness	Further developing the **link between energy access and climate mitigation and adaptation** opens opportunities to **maximise project impacts**
Mobilising effect	Defining this relationship can also **unlock financing** for energy access from a growing number of **"climate first" donors, funds, and investors**

Figure 4.10: Climate finance provided to developing countries[44]



44 Ibid.

45 OECD, "Climate Finance Provided and Mobilised by Developed Countries in 2013-2021: Aggregate Trends and Opportunities for Scaling Up Adaptation and Mobilised Private Finance."

The public and private sources providing climate finance for developing countries significantly overlap with those contributing to energy access. For example, in 2022, MDBs allocated $60.9 billion in climate finance, which was supported by $46.3 billion in co-investments.[46] The UN Framework Convention on Climate Change (UNFCCC) has seen the establishment of the three major global climate funds as well as several smaller ones. The largest of these is the Green Climate Fund (GCF), with current pledges of over $20 billion. Climate funds have also been established at the national and regional levels, including with participation by private foundations and other donors, and anecdotal evidence suggests that impact investors and other sources of mobilised private capital for energy access are interested in the space.

Energy access contributes to both adaptation and mitigation, making it eligible for support from climate finance sources, but work is needed to strengthen this link. While overall climate finance volumes have steadily increased over the last decade, the share allocated to energy fell from 38% in 2016 to 26% in 2021.[47] This also coincides with the decline in overall public and private funding for energy access recorded in recent years.[48] Understanding the increasing focus of donors and more impact-minded lenders and investors on climate action and demonstrating the role of energy access in this effort remains crucial to attracting the concessional funding which is essential for supporting access to finance for small and local companies.

Today, energy access receives a significant share of mitigation funding, in part thanks to the early efforts of SDG7 stakeholders in helping climate funds to understand the space. Clean cooking, for example, is included in the nationally determined contributions (NDCs) of at least 96 countries as of the end of 2023.[49] Given that inclusion of a target in a country's NDC is often part of the eligibility criteria of many climate funds, stakeholders such as GOGLA have called for the SDG 7 community to ensure greater inclusion of off-grid energy access in NDCs as a way to drive momentum for this crucial tool for building low-carbon energy systems.[50]

As climate change impacts worsen, adaptation and resilience have also grown in importance, and effective calls from vulnerable countries led to a pledge at COP26 in Glasgow to double adaptation finance flows by 2025.[51] Greater access to energy has an important role to play in adaptation. For example, solar charging capabilities provide households with access to information about severe weather events, while fans and cooling devices can help combat heat waves.[52] PUE applications, meanwhile, contribute to community poverty reduction and, when deployed in the agricultural sector, strengthen food security. Yet today almost no adaptation funding goes to energy access, and it is scarcely featured in countries' national adaptation plans (NAPs). Local energy access SMEs are some of the best poised to draw that link, as they see firsthand how the products and services they provide impact the communities where they operate. With proper support from partners, these companies can unlock climate finance from governments, donors, commercial actors, and other stakeholders that are increasing their funding for adaptation.

46 EIB, "2022 Joint Report on Multilateral Development Banks' Climate Finance."
47 OECD, "Climate Finance Provided and Mobilised by Developed Countries in 2013-2021."
48 IEA et al., "Tracking SDG 7: The Energy Progress Report."
49 Clean Cooking Alliance, "Nationally Determined Contributions and Clean Cooking."
50 Adelina Alexandru, "Unlocking the $100 Billion Climate Finance Opportunity for Off-Grid Solar | GOGLA."
51 UNFCCC, "COP26 Outcomes: Finance for Climate Adaptation."
52 GOGLA, "Powering Climate Adaptation and Justice: The Critical Role of Off-Grid Solar Technologies."

Key barriers to mobilising climate finance for energy access and action steps are summarised below:

Figure 4.11 Challenges and solutions to unlock climate finance for energy access

Barrier	Description	Solution
Limited inclusion of energy access in country climate plans	• Lack of inclusion of energy access in NDCs, NAPs, and other environment strategies limits eligibility for finance from certain climate funds	• Partnerships with government (e.g. environmental, agricultural and energy ministries) to identify potential for energy access to support climate and adaptation targets
Lack of definition/ measurement of adaptation impacts	• Lack of a consistent framework for measuring adaptation impacts of energy access hinders its inclusion in efforts to support adaptation	• Identifying optimal strategies to deploy energy access technologies for adaptation based on community exposure • Development and standardisation of KPIs to clearly measure impacts across climate finance community
Low flows of private climate finance to developing countries	• Though private actors provide 50% of global climate finance,[53] they account for a much smaller share of flows to developing countries	• Exploring opportunities to deploy innovative financing tools and strategies that have successfully mobilised energy access finance to attract private climate finance • Incorporating support in effective use of climate finance into government and company capacity building programs already in place for energy access

53 Buchner et al., "Global Landscape of Climate Finance 2023."

Case study: Linking energy access and climate

Connecting energy access to community adaptation and resilience: LEAF and Nithio

In a 2023 position paper,[54] GOGLA took initial steps to document the adaptation and resilience impacts of different energy access technologies. This research has supported the African Development Bank (AfDB) and GCF's effort to develop a framework for measuring and monitoring these impacts under the Leveraging Energy Access Finance (LEAF) program.

Measuring the adaptation impacts of energy access will be key to unlocking climate finance, but innovative financing solutions must operationalise the research in order to mobilise commercial capital for both goals. The climate fintech platform Nithio explicitly aims to de-risk and optimise energy access projects that support community adaptation and resilience. The platform combines data-backed credit risk and needs assessments and blended finance to mobilise finance from public and private sources for energy-powered adaptation.

EnDev's role in linking climate and energy access

For several years now, EnDev has sought to reinforce the relationship between mitigation and energy access across its portfolio by documenting emissions avoidance as part of its project KPIs, working with its government partners to develop climate-aligned clean cooking strategies and partnering with climate funds to develop markets for energy access. The EnDev-associated project 'Promotion of Climate-Friendly Cooking: Kenya and Senegal' marks EnDev's first partnership with GCF to pilot an innovative, market-based approach to clean cooking market development for mitigation purposes. In terms of adaptation, EnDev is actively studying the contributions of its projects to adaptation, developing a methodology for measuring and monitoring these impacts, and will incorporate specific targets in its 2025 strategy.

54 GOGLA, "Powering Climate Adaptation and Justice."

5 Conclusion and Recommendations

This year's ELIA drew on the expertise and experience of the EnDev CoP and the broader SDG 7 community to identify existing and emerging financing tools for energy access, assess when and how they are most appropriately deployed, and better define what innovative finance means in the energy access context. To this end, interviews were conducted with more than 20 experts from within EnDev and the SDG 7 community broadly, in addition to a survey completed by 29 members of the CoP and an extensive review of the literature. The findings were further refined through a series of six workshops that highlighted different elements of innovative finance via presentations from practitioners who ranged from investment professionals to development professionals to company founders and entrepreneurs.

Based on this research, the following elements of innovative finance was defined as an experimental form of finance which channels money in an effective and efficient way and helps mobilise additional funding to close existing gaps. Both new tools and traditional tools deployed in new ways, new geographies, or new market segments can be considered as innovative finance.

A review of the financing tools for energy access revealed that the applicability of traditional financing instruments largely depends on the growth stage of individual companies and the maturity of a given market. Nascent markets and early stage companies are the most in need of concessional mechanisms. Similarly, subsidies are indispensable for ensuring affordability of energy access for low-income customers. However, concessional capital like grants and subsidies should be deployed intentionally and with the aim of preparing markets to transition to commercial finance, as this is essential to achieve the scale needed to meet SDG 7.

The research also revealed several barriers that prevent energy access companies from accessing traditional commercial finance. One of the biggest is that most companies in the SDG 7 space often need capital in amounts not large enough to justify the transaction costs for financiers. This is compounded by the fact that energy access is considered a high-risk sector, driving up the cost of capital and due diligence requirements. Other macro factors such as exchange rate volatility and shrinking pool of concessional capital in recent years also prevent companies from accessing the financing they need. Unsurprisingly, all of these burdens fall hardest on SMEs and locally founded companies that don't have connections to international partners.

A number of alternative financial tools have emerged in recent years and have the potential to help energy access companies overcome some of these barriers. These more innovative tools address various specific challenges, including ticket size and risk, but often come with barriers of their own that make them most accessible to companies that have already achieved a certain scale. The smallest and newest companies will remain unable to access these innovative mechanisms without concessional funding and technical assistance from development partners.

Given EnDev's programmatic focus on supporting small and local companies that provide energy access, specific attention was given to this issue both in the research and workshops. In conversations with energy access entrepreneurs, the challenges due to burdensome diligence requirements, lack of continuity in funding, and inability to access local currency financing came up, in addition to the general challenges of ticket size mismatch and heightened risk perception.

EnDev's role in the innovative finance for energy access

The ELIA thus focused on three key trends which were found to have innovative potential in regard to these companies and around which EnDev has the potential to play an important and catalytic role in expanding access: crowdfunding, local currency financing and climate finance. The following key recommendations have been identified for EnDev to support innovative finance for energy access at large, and particularly for locally owned and early-stage SMEs.

As a financial actor in the energy access space, EnDev has three important roles: deploying

concessional grant funding in the space, building the capacity of local companies, and working with government partners to build an enabling environment in which energy access companies can thrive. With regards to facilitating access to innovative finance in general and catalysing the three identified trends, EnDev should focus on the following:

Recommendation 1: Address challenges of companies, customers, and financiers

- Continue to provide grants and technical assistance for early stage and local companies that help them professionalise their business and meet the requirements of commercial financiers, including developing a credit history and producing strong pitches and audited financials
- Continue optimising the deployment of demand-side subsidies to ensure affordability for customers and increase addressable market size for companies while minimising market distortions
- Seek opportunities to deploy EnDev's funding in ways that:
    - Reduce risk or improve return prospects for commercial financiers in order to crowd in capital from new sources to support energy access
    - Reduce transaction costs for prospective financiers or investors who see this as a deterrent to engaging in the energy access space
    - Reduce administrative and due diligence costs for smaller companies seeking first-time finance or accessing financing mechanisms with more rigorous compliance requirements

Recommendation 2: Crowd in risk-averse lenders and financiers to increase access to crowd funding

- Support to crowdfunding platforms to reduce transaction costs and risk for financiers and enable platforms offer the small ticket-size loans that are in high demand by many energy access SMEs

Recommendation 3: Get local financiers involved in energy access

- Incorporate into projects technical assistance to local financial institutions to help them understand energy access as a sector and build capacity to assess investments in these companies
- Explore opportunities to deploy EnDev's funding or collaborate with other SDG 7 stakeholders to design innovative finance initiatives that mitigate risk for local financial institutions and enable them to lend to energy access market segments

Recommendation 4: Position energy access to benefit from climate finance

- Increase focus on working with environmental and climate ministries to incorporate energy access into official climate adaptation and mitigation planning so that companies can qualify for funding geared towards adaptation and mitigation
- Collaborate across the SDG 7 and SDG 13 communities to find synergies between energy access and climate mitigation/ adaptation and highlight the connection so that energy access companies can access the growing pool of climate-first donors and investors

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