

Policy pointers

Governments can use a range of publicly funded 'inclusive finance' mechanisms to leverage the private investment needed for off-grid energy to play its part in achieving SDG7.

Government-backed agencies or special intermediaries can spur the development of off-grid energy markets and set targets to ensure they benefit poor, hard-to-reach communities.

Governments, energy enterprises, financiers and civil society should coordinate closely to make sure regulatory and policy changes can unlock the right finance for off-grid projects.

National platforms designed to encourage innovation among diverse stakeholders can help policymakers and regulators respond to specific contexts and fast-changing markets.

Bridging the gap: how inclusive finance boosts access to off-grid energy

Off-grid solutions¹ can be designed to provide affordable electricity to poor communities in hard-to-reach areas but receive only a fraction of annual global investment in energy provision. Governments hoping to harness these technologies to achieve Sustainable Development Goal 7 — universal access to energy by 2030 — must therefore find new ways to attract more finance. Drawing on research in Nepal and Bangladesh, this briefing shows how policymakers, financiers, civil society and the private sector can leverage 'inclusive' financing models to unlock the private investment needed to provide off-grid systems to marginalised communities and bridge the energy access gap.

Technologies that provide people with energy without being connected to a main electricity grid are known as 'off-grid energy' solutions. Examples include solar home systems (SHS), local mini-grids and solar irrigation pumps. Such systems could play a big role in helping to achieve Sustainable Development Goal 7 (SDG7): sustainable energy for all by 2030.

There are encouraging signs: in the five years to 2016, the number of people served by off-grid renewable energy increased six-fold to 133 million, mostly via solar lighting and SHS.² But even this rapid growth is not increasing quickly enough to meet SDG7. The main problem is a lack of financing. One promising response would be to make much more widespread use of a range of 'inclusive' financial instruments. These mechanisms are designed to bring off-grid energy to the kinds of poorer and most remote communities that tend to be excluded by traditional financing arrangements.

Tracking financial flows to off-grid electrification

Recent data helps to put the rapid pace — and limitations — of the growth of off-grid energy into context. Financial commitments for off-grid electrification solutions, including mini-grid technologies, rose to US\$380 million from US\$210 million in the two years to 2016 in 20 high-impact countries monitored by Sustainable Energy for All (SEforALL). Nevertheless, these flows still only accounted for 1.3% of total tracked financing for electricity.³ They are clearly nowhere near enough to achieve SDG7: the International Energy Agency projects that meeting that goal will require an annual investment of about US\$52 billion from 2017–2030 — with about a quarter going to off-grid solutions such as SHS, and just over 40% to mini-grids.^{4,5}

Philanthropic foundations, private equity funds and venture capitalists back some off-grid

Inclusive finance could play a vital role in mobilising the funds needed to ensure that often-marginalised communities can finally access the off-grid electricity they need

projects, but the vast majority depend on public finance from Development Finance Institutions (DFI). In India only, DFIs provide 85% of the finance for off-grid projects through multilateral assistance, and a further 10% through bilateral arrangements, according to SEforALL. This funding stream tends to fluctuate: international public finance for both on- and off-grid electrification in the 20 countries SEforALL monitors fell to US\$8.8 billion in 2016 from US\$10.5 billion two years previously.³

Nor has financing for electrification been evenly distributed. The European Union and its member states were the largest donors of Official Development Assistance for energy, with a €22 billion commitment for 2010–2014. Of this, ten lower-middle-income countries received the largest share and only two of them, Kenya and India, have electrification rates below 90%.⁶ Similarly, two thirds of all electrification finance that SEforALL tracked in 2015 was concentrated in South Asia, mainly India.³

Why is it so hard to obtain financing for off-grid energy?

The barriers to investment have been analysed in detail in recent years, and include:^{7,8,9}

- Actual and perceived risks (political, regulatory, currency-related and so on)
- Shortage of proven business models and good quality business plans
- Investor short-termism
- High minimum investments and transaction costs, especially for systems for remote and low-income groups
- Lack of suitable financing options from national banking systems
- Lack of clear and stable regulatory frameworks and policies favouring decentralised energy.

In many countries, energy enterprises face significant challenges: thin margins; high-risk environments; a lack of qualified staff and expensive local debt. Even with proven technologies and business models, affordable and patient financing can be tough to secure and capital tends to flow to larger players: Four big energy enterprises received 56% of

the total financing for the off-grid solar sector from 2012–2017.^{3,10,11}

How public finance can close the gap

Research from IIED, summarised in Box 1, shows how Nepal and Bangladesh have used public finance to expand access to off-grid energy using a combination of grants, subsidies, concessionary loans, and the development of new, inclusive financial instruments. Roll-outs in these countries have reached a significantly higher percentage of poorer households than in Tanzania and Kenya, for example, where governments have invested proportionally fewer public funds to kick-start the off-grid sector.

What has been learned about the use of subsidies?

Subsidies have been used to catalyse the development of new off-grid electrification and clean cooking markets. In Nepal, AEPC has used subsidies to boost the uptake of renewable energy technologies, worked with the private sector to develop a market, and improved product standards through its quality assurance processes. IIED has found that 36% of the subsidised SHS during the period of 2012–2017 reached communities in some of the remotest and poorest areas where they would not have otherwise reached. Over 45% of these systems were owned by women.¹⁰ In Bangladesh, an independent study shows that over 80% of smaller SHS (less than 30 Watts) went to poor communities.¹²

However, discernment in applying subsidies is the key to avoiding future market distortion and benefiting targeted community groups as planned. AEPC's subsidies instilled the confidence needed to foster a market among poorer and most remote user groups, but they also complicated the eventual transition to commercial lending — a failure that might have been avoided with better long-term planning. Furthermore, complex or hard-to-administer subsidy systems can increase transaction costs, delay finance and enable malpractice. AEPC and its financiers established CREF to address these challenges, although its mandate is yet to be fully defined. IDCOL's SHS programme eventually phased out its initial modest subsidy as the market matured — apart from subsidies for small off-grid systems for the poorest. IDCOL has helped develop a sustainable market while preserving a level playing field for other entrants, but the agency is yet to assess the extent to which its phased approach has reached targeted user groups.^{10,12,13,14}

Box 1. Public finance for off-grid energy in Bangladesh and Nepal

Bangladesh channels public finance for off-grid renewable energy through a donor-funded special purpose agency: the Infrastructure Development Company Limited (IDCOL). IDCOL also provides capacity support, quality control and training for energy enterprises and user communities. IDCOL's SHS Programme, which received initial funding from the World Bank in 2003, achieved its targets ahead of time, resulting in increased investments from multilateral and bilateral DFIs. IDCOL's current targets are: six million SHS by 2021 (with four million reached by 2018); 50,000 solar irrigation pumps by 2025; and 100 solar mini-grids by 2025. IDCOL is currently blending public finance it receives for solar mini-grids and solar irrigation pumps with commercial equity from energy enterprises.

Nepal's Alternative Energy Promotion Centre (AEPC) was set up as a technical and financial intermediary between donors, governments and others to channel finance into off-grid renewable energy, primarily through subsidies. AEPC in turn established a Central Renewable Energy Fund (CREF) to steer funding via commercial banks and microfinance institutions. Nepal's subsidy policy clearly defines subsidies for targeted communities based on remoteness, gender and social groups. Working with private sector associations, AEPC has facilitated training for technicians, including those from very remote areas. From 2012–17, Nepal's government provided about 60% of total public finance for the off-grid sector.

Both models have reached millions of people: both have encountered challenges. Bangladesh's IDCOL's participants faced widespread loan defaults as cheaper, lower-quality products entered the market and the government distributed free systems while also rapidly expanding the grid. In Nepal, AEPC's community ownership model did not always raise sufficient equity, and energy enterprises faced significant financial challenges, especially for micro-hydro projects.

These experiences underscore the importance of structuring financing within a broader policy and social context, and adjusting based on lessons learned from a continuous process of evaluation.

In East Africa, donors have attempted to boost the off-grid market by giving energy enterprises Results-Based Financing (RBF) grants for each new end user reached. While donors argue that RBF can help target specific population groups,¹⁵ more evidence is needed on the extent to which RBF has successfully and sustainably brought off-grid energy to remote and poor communities.

Evidence suggest that subsidies remain a crucial inclusive financial instrument and should not be ruled out, rather designed with long-term targets to address specific market conditions and needs.

Finance aggregation: a promising way to mobilise investment

A particularly promising path for promoting investment in off-grid energy is known as finance aggregation: where energy enterprises or investors pool capital into a portfolio of projects to cut costs and hedge risk. Aggregation can also be used to create new investment products; perhaps by bundling up smaller loans, using targeted subsidies, blending public-private finance or by merging several projects and their assets into a single investment vehicle.

Although off-grid energy finance aggregators vary significantly, IIED notes that many of them do more than aggregate finance on the supply side. These vehicles can also aggregate customer demand, different types of energy service technologies and business models, and perform functions such as capacity building and setting product standards.¹⁶

Dedicated intermediary institutions such as IDCOL and AEPC are useful examples of aggregators with government mandates to finance and oversee several off-grid energy projects. On the other end of the spectrum, commercial aggregators — such as SunFunder, a solar energy financial intermediary — blend finance from private investors, DFIs and impact investors into funds that invest in diversified portfolios.^{10,16}

Aggregators may also provide other services to promote off-grid investment in under-served communities, such as performing quality assurance and due diligence, and by addressing capacity and awareness gaps among energy enterprises and customers.

Next steps

New financing arrangements for off-grid energy are most likely to succeed when considered holistically in terms of a specific policy,

regulatory and social context. We recommend that governments, DFIs and other stakeholders:

- **Recognise the role of public finance.** Governments can learn from Nepal and Bangladesh, where public finance, mobilised as subsidies and concessionary loans, has incentivised the deployment of off-grid energy in poor and remote communities.
- **Explore new financing vehicles.** Special financial intermediaries or aggregators can help mobilise private sector investment by blending public-private finance, and facilitating closer collaboration between financiers, off-grid energy enterprises and the state.
- **Set and achieve targets.** IDCOL in Bangladesh has shown how to spur investment by setting realistic, measurable objectives for delivering off-grid energy.
- **Coordinate.** Government agencies, the private sector, financiers and civil society all need to work together to ensure optimal policy and regulatory reform. In Bangladesh, for example, IDCOL is starting to coordinate off-grid energy projects with the government's grid-extension roll-out.
- **Incentivise the private sector.** A suitable policy and regulatory framework, and fiscal incentives, must be developed in conjunction with the private sector. AEPC has shown that energy enterprises are far

more likely to invest in off-grid energy for remote areas, women or other marginalised groups when given the right incentives and clear policy direction.

- **National experimentation and learning platforms.** Governments and financiers should encourage multi-stakeholder coordination to help the various players in off-grid power to develop, test and scale new evidence-based policies, technologies and financial instruments, and adapt to fast-changing market dynamics.
- **Monitor impacts and lessons learnt.** Policies, regulatory frameworks and programmes can only be developed to successfully support marginalised communities in the light of evidence. IDCOL's publicly funded monitoring has informed its decisions, particularly over its subsidy phase-out.

With hundreds of billions of dollars of investment still required to achieve SDG 7, inclusive finance could play a vital role in mobilising the funds needed to ensure that women and other often-marginalised communities can finally access the off-grid electricity they need.

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Notes

¹ This briefing primarily examines financing for off-grid electrification as part of a larger research study, but it should be emphasised that our policy recommendations are also relevant to promoting clean cooking. / ² IRENA (2018) Off-grid Renewable Energy Solutions: Global and regional status and trends. www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jul/IRENA_Off-grid_RE_Solutions_2018.pdf / ³ SEforALL (2018) Energizing Finance: Understanding the Landscape. www.seforall.org/EnergizingFinance/ / ⁴ International Energy Agency (2017) Energy Access Outlook 2017. World Energy Outlook Special Report. Available at: <https://webstore.iea.org/weo-2017-special-report-energy-access-outlook> / ⁵ Calculated by combining the figures from IEA (2017) on cumulative and additional 'Energy for all' investments needed under the New Policies Scenario (2017–2030) modelling. / ⁶ Grosse-Puppenthal, S, Bilal, S and Karaki, K (2017) The EU's financial instruments for access to energy in sub-Saharan Africa. Discussion Paper 218. ECDPM, Maastricht. <https://ecdpm.org/publications/eu-financial-instruments-access-energy-sub-saharan-africa/> / ⁷ Practical Action (2017) Poor people's energy outlook 2017: Financing national energy access: a bottom-up approach. <https://doi.org/10.3362/9781780446813> / ⁸ Rai, N, Best, S and Soanes, M (2016) Unlocking climate finance for decentralised energy access. IIED, London. <http://pubs.iied.org/16621IIED> / ⁹ Energy Access Practitioner Network (2016) 2016 survey results: distributed energy market trends and analysis. United Nations Foundation, Washington, DC, USA. See: http://energyaccess.org/wp-content/uploads/2017/03/2017_EAPN_final.pdf / ¹⁰ IIED ongoing research. / ¹¹ GOGLA (2018) Off-Grid Solar Market Trends Report. / ¹² Hossain, M (2018) Green Finance in Bangladesh: Policies, Institutions and Challenges. ADBI Working Paper Series. Asian Development Bank Institute. www.adbi.org/sites/default/files/publication/467886/adbi-wp892.pdf / ¹³ BNEF (2016) IDCOL-lapse: the unmaking of an off-grid solar market. Research note. / ¹⁴ Rai, N, Iqbal, A, Zareen, A, Mahmood, T, Muzammil, M, Huq, S and Elahi, N (2015), Financing inclusive low-carbon resilient development: Role of Central Bank of Bangladesh and Infrastructure Development Company Limited. IIED, London. <http://pubs.iied.org/10139IIED> / ¹⁵ Weber, E, Hirner, V and Geres, P (2018) Results-based Financing for Energy Access. How to design and implement projects: Lessons from the field. GIZ, Germany. https://endev.info/images/e/e4/EnDev_-_Results-based_Financing_for_Energy_Access%2C_Lessons_report.pdf / ¹⁶ Shakya C and Byrnes, R (2017) Turning up the volume: financial aggregation for off-grid energy. IIED, London. <http://pubs.iied.org/16636IIED>