



Off-grid energy in remote communities: Lessons from South America

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Abstract

The Smart Villages Initiative, in partnership with Soluciones Prácticas (Practical Action) organised a workshop in Lima Peru on 24–26th January 2016 to consider South America’s experience of reducing rural poverty through access to, and use of, sustainable energy sources

South American countries have made significant progress in energy access, but more than 30 million people (around 7% of the population) continue to live without electricity. While energy access levels are much higher than in South Asia and sub-Saharan Africa, the communities remaining without electricity typically live in particularly remote locations, in the mountains or Amazonian forests. Their remoteness is linked to high levels of poverty, making electricity less affordable. Bringing electricity and cleaner, sustainable cooking technologies to these communities therefore represents a major challenge if universal energy access is to be achieved by 2030 as required by the Sustainable Development Goals.

From 24-26 January 2016, experts from across the region gathered to discuss this challenge and the opportunities to address it. The workshop on “Sustainable energy sources for rural electrification in off-grid communities in South America: Challenges and prospects” was co-hosted by Soluciones Prácticas (Practical Action) and the Smart Villages Initiative in Lima, Peru. It marked the beginning of the Smart Villages Initiative’s engagement in South America. The workshop focused broadly on the region’s common challenges as well as the unique requirements of each remote community that lacks energy access. The workshop report summarises the presentations and discussion: this brief distils key findings and messages for policymakers, development organisations, and other stakeholders.



Solar home systems

Solar home systems, providing a basic level of electricity to individual households, can make a useful contribution. As in other regions, the upfront costs of the equipment, exacerbated by the costs associated with effective distribution, operation and maintenance in dispersed populations living in difficult terrain, is the major challenge for households with low incomes. Many government- and NGO-led schemes have addressed this problem through providing some kind of subsidy. Pay-as-you-go models, enabled by mobile phone connectivity, are emerging as an alternative approach but are not so well developed as in East Africa where private companies are playing a much stronger role in the deployment of home-based systems.

Substantial advances in solar home systems over recent years have led to the development of third-generation systems, which are now becoming available in South America. The weight and size of the systems is much smaller than earlier technologies making them more portable. They are based on “plug and play” design approaches making them easier to install and maintain. These developments together with more efficient domestic appliances, have reduced the costs of providing a given level of services by 30–50%. Such cost reductions combined with the innovative business models developed elsewhere to overcome initial cost hurdles, mean that solar home systems should become a more affordable proposition for poor rural households and that the private sector will play a stronger role in South America in future in their deployment provided that governments put in place supportive policy and regulatory frameworks.

As in other regions, poor quality and counterfeit products are a problem, undermining the confidence of households to make, what is for them, a major investment in a solar home system. Governments need to put in place effective systems for the certification of products (noting that this can represent a significant call on resources), and can usefully run awareness campaigns to help householders distinguish the good from the bad. In order to ease the challenges of providing effective after sales services, there were calls for more standardisation of components so that replacement parts can be made more readily available in remote areas.

Mini-grids

In remote communities for which national grid extension is uneconomic, mini-grids, designed to meet the needs of a village or cluster of villages, can provide a higher level of electricity services than solar home systems, potentially also supporting productive enterprises. Increasingly, such mini-grids are being powered by renewable energy (solar, micro-hydro, biomass and wind), often in a hybrid system incorporating the diesel generators that they partially replace. Hybridisation in this way can be an economical approach to providing 24-7 services and improving the stability of the local grid when using renewable energy (particularly solar and wind).

Such village-level schemes should be driven by the community: there needs to be a strong sense of ownership. Given the distrust of collective and social organisations in some South American countries, building community buy-in and ownership can be difficult, leading to commentaries on the lines of “the technology is the easy part”.

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Development benefits

Energy access does not necessarily lead to development benefits in the form of enhanced community services (health, education, clean water and sanitation, etc.) and increased incomes through productive enterprises. A strong message from the workshop was that realising development benefits should be the core driver of energy access initiatives. In many cases, this requires a paradigm shift and a new mindset. Approaches should be centred on what is valued by the community, requiring their effective engagement in any initiative.

“Realising development benefits should be the core driver of energy access initiatives”

In addition, the long-term financial sustainability of energy schemes may well rely on increasing villagers’ incomes through raising the productivity of existing, and introducing new, enterprises. Given that agriculture forms the basis of most rural village economies, capturing more of the agricultural value chain at the local level through agro-processing, reducing wastage and achieving better market prices should be a particular focus. In order to make the case for financial support for future energy access interventions, more evidence is needed on the mechanisms and enabling factors through which energy access initiatives can be designed to increase incomes and support enhanced social services.

Governments

Governments play a crucial role in energy access. Not least, they must provide strong political will and an overarching vision if universal energy access in South America is to be achieved by 2030. Time is short, and previous experience is that achieving energy access has taken more time and resources than anticipated. Governments must develop a coherent view on the roles they wish key actors—the private sector, NGOs, national/state utilities, etc.—to play in delivering the vision, and put in place coherent policy and regulatory frameworks that enable their required contributions.

Private sector involvement will require stable and supportive policy and regulatory frameworks providing the necessary confidence for companies and financiers to invest. Building effective value chains for the provision of energy services requires an environment in which bureaucracies and tax regimes do not impose undue hold-ups and costs, and divert attention from gaining and meeting the needs of customers. A key consideration is that affordable finance needs to be available to companies and to households. Governments can usefully make available data on market conditions in unserved rural communities and the potential availability of renewable energy resources, and take initiatives on capacity building, awareness and product quality assurance as discussed above.

To the extent that governments intervene directly in providing energy access, top-down, “one-size-fits-all” initiatives should be avoided. Rather, interventions should be responsive to local needs.

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Decisions need to be taken on which is the most appropriate level of government to take the lead—national, state or local—bearing in mind capabilities and familiarity with, and connectivity to, local communities. In some South American countries, what might otherwise be an appropriate level of government to lead an intervention lacks the capacity to do so, and institutional capacity building may be necessary. Communication between the various levels of government may need to be enhanced. Recognising that the aim of energy access initiatives is to support development, Ministries must collaborate effectively to ensure that an integrated approach is taken.

Subsidies have played an important role in the progress made to date in providing energy services to rural communities. While solar home systems have reached a tipping point in which future deployment may increasingly be based on fully commercial models, mini-grids providing higher levels of energy services may well continue to require subsidies. Such subsidies should be well targeted and time limited, and calculated to bring revenues up to a level that makes projects viable. Giveaways should be avoided—they result in a lack of ownership and consequently disuse, and can spoil the market for more sustainable business-led approaches.

Concerns were expressed that South American governments have lacked a common vision on energy access, and have consequently not spoken with a single voice, reducing their influence on key international initiatives such as the COP21 climate negotiations. Also, more could usefully be done to share experiences on energy access pilots between countries. Going forward, international development financing may become less available as several countries (such as Brazil, Argentina and Chile) in South America have changed status in the eyes of major donors.

Notes

We aim to provide policymakers, donors, and development agencies concerned with rural energy access with new insights on the real barriers to energy access in villages in developing countries—technological, financial and political—and how they can be overcome. We have chosen to focus on remote off-grid villages, where local solutions (home- or institution-based systems and mini-grids) are both more realistic and cheaper than national grid extension. Our concern is to ensure that energy access results in development and the creation of ‘smart villages’ in which many of the benefits of life in modern societies are available to rural communities.

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