



## Findings from the Dhaka Smart Villages Workshop

John Holmes



### Abstract

The Smart Villages Initiative together with its local partner, Practical Action Consulting South Asia, held a workshop in Dhaka on 26 August 2015 to consider the experience in Bangladesh of off-grid rural energy systems. This briefing note for policy-makers and other stakeholders summarises key points emerging from the workshop.

### Solar home systems

Bangladesh has established a world-leading position on solar home systems (SHS), having deployed nearly four million systems. The government-owned financial institution, Infrastructure Development Company Ltd. (IDCOL), has played a central role in this achievement. Funded by the Bangladesh government and by international development partners, IDCOL has taken an integrated and comprehensive approach by coordinating stakeholders and resources. Ownership of the scheme by its stakeholders has been a major factor in its success. Other important factors have included:

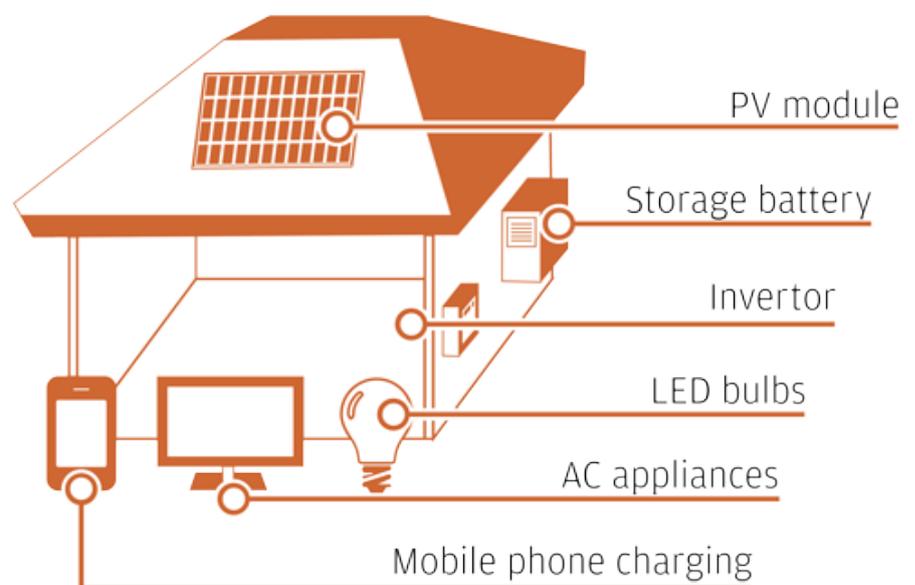
- Establishing a quality assurance framework, setting technical standards for the equipment deployed within the scheme, and providing an approval mechanism for partner organisations delivering SHS to households.
- Providing technical support through a call centre available to all participating households.
- Establishing arrangements for repayment by households of equipment costs over a three-year period, augmented by a small grant towards the equipment costs.
- Channelling subsidised financing to partner organisations, and through them, to households.

Notwithstanding the successes, a number of issues remain, including that some households find monthly instalment payments to be too high and revenue recovery is low for IDCOL's partner organisations. Consequently, there has been a big growth in the non-IDCOL SHS market where equipment costs may be lower, but SHS-specific finance packages are not generally available. There are quality problems in this market.

*“More emphasis is needed on skills development to overcome shortages in higher-end skills”*

Workshop participants made the following **recommendations** to further enhance the effectiveness of initiatives to deploy SHS in Bangladesh:

- Regulation should focus on providing and implementing quality standards and should be supported by initiatives to provide the public with information on quality issues so that they can make informed choices. This information should include maintenance and servicing costs.
- More emphasis is needed on skills development to overcome shortages in higher-end skills to install and maintain SHS and to address the problem of high turnover rates of skilled staff.
- Batteries remain a weak link. There should be a shift away from lead acid batteries to more advanced technologies. While the buyback system for redundant batteries is good, attention is needed to increasing battery recycling capacity.
- Most of the equipment comprising SHS is manufactured in Bangladesh, but it is generally more expensive than equipment made in China or India. Consequently, there should be a drive to reduce domestic production costs.
- Subsidies may appropriately continue to be provided through low-interest loans but should focus on poverty reduction and developing hard to reach, un-served markets rather than domestic production of SHS.



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*“DC nano-grids provide an intermediate level of electricity supply between SHS and mini-grids that can be more cost-effective.”*

## Mini-grids

To date, there has been limited deployment of mini-grids in Bangladesh: high population densities limit the situations in which they are preferred to grid extension. Islands are one such situation. Workshop participants recommended that mini-grids should enjoy the same level of government support as grid extension in order to facilitate investment in mini-grids in appropriate circumstances. Attention should be given to:

- Making available low-cost financing (with sufficiently long repayment periods) to attract private sector investment in mini-grids.
- Undertaking detailed stakeholder surveys and engaging effectively with recipient communities to ensure that schemes are appropriately sized and designed.
- Providing appropriate safeguards, robust to political cycles, so that private investors can be confident of getting acceptable return on their investments (especially in the case where the national grid is extended into a mini-grid area).
- International R&D to decrease capital costs.
- Development of technical and administrative resources to support operation and maintenance, together with comprehensive maintenance and operation protocols.
- The ability of poor households and institutions such as schools to afford mini-grid connection and electricity charges.
- Ensuring that there are clear plans for grid extension in order to guide site selection for mini-grids.

DC nano-grids supplying 10 to 30 households provide an intermediate level of electricity supply between SHS and mini-grids that can be more cost-effective in specific situations. The effectiveness of such nano-grids is enhanced by the increasing availability of high-efficiency DC appliances and through the use of smart meters to support variable charging through the day to help match supply and demand. However, consideration should be given to whether households may then be locked out of AC appliances.

## Improving livelihoods

Energy is an enabler of development, but it needs to be of a sufficient quantity and quality to be truly transformative. And the relationship with improved livelihoods is not direct because other barriers and blockages may exist that keep people in poverty.

A systematic approach to analysing such barriers is needed, as for example, through the “market mapping” approach developed by Practical Action. Barriers can include, for example: lack of job opportunities, unaffordability of appliances, shortages of raw materials, unequal

accrual of benefits across society, or the lack of a market for energy enabled goods and services. To address these barriers, developers of energy access programmes should link with other development programmes. This will help to ensure that all the enabling conditions are in place for people to enhance their livelihoods with energy access. In particular, consideration should be given to investment in productive end use within the pre-existing economic activities in a community or region.

## Concluding comments

Access to electricity has been identified as the most binding constraint to economic growth in Bangladesh<sup>1</sup>. The workshop successfully took stock of Bangladesh’s achievements to date in off-grid electricity supply and pointed to further developments that will be necessary to ensure that the off-grid electricity supply sector can fully contribute to electricity access in the future. Lessons from the experiences of Bangladesh may usefully inform initiatives in other countries in the region and elsewhere.

<sup>1</sup> US AID and UK AID, ‘Bangladesh: Inclusive Growth Diagnostic’, June 2014. <https://www.gov.uk/government/publications/bangladesh-inclusive-growth-diagnostic-june-2014>

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## 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.

www.e4sv.org | info@e4sv.org | @e4SmartVillages

CMEDT – Smart Villages Initiative, c/o Trinity College, Cambridge, CB2 1TQ

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