

A survey of energy access solutions

The participants in the Brookings Blum Roundtable noted that the prospects for expanding access to clean energy among the world's poor are improving rapidly as a result of new technologies available at affordable costs. Here we profile six innovative energy access products and services identified in the International Finance Corporation's 2012 report *From Gap to Opportunity: Business Models for Scaling Up Energy Access*. The IFC estimates that the propagation of these solutions could annually prevent 800,000 premature deaths related to indoor air pollution and 300 million metric tons of carbon dioxide emissions.

- **Improved cookstoves:** Thanks to sustained engagement from business, researchers and governments, there now exists a range of competitively priced and customer-driven well-designed cookstoves that achieve improved efficiency (with between 30 and 50 percent savings in fuel) and reduced emissions. Competitors include both local small and medium-sized enterprises, such as the Ghana-based Toyola Energy, and international players, such as U.S.-based Envirofit. Commercial costs for improved cookstoves now start at as little as \$5, or 40 cents per month over the life cycle of the product.
- **Solar and rechargeable lanterns:** Solar and rechargeable lanterns, which combine small photovoltaic panels, non-disposable batteries and an LED lightbulb, are recording large decreases in price thanks to economies of scale. With prices as low as \$10, these products are gaining popularity with both the rural poor and urban slum dwellers as a

cost-effective and durable alternative to less safe and clean kerosene lamps. Many of these lanterns are now being fitted to allow for mobile phone charging, such as those produced by the India-based for-profit social enterprise d.light, whose products have reached more than 10 million people.

- **Solar kits:** Solar kits typically include a portable solar panel, nondisposable batteries, multiple lights and sockets for mobile phones and small appliances such as a black-and-white television. These have higher energy storage capacity than the more simple solar and rechargeable lanterns, are efficient, can be bought off-the-shelf, and do not require installation or much maintenance. Retailing at \$100–\$150, solar kits are considered an aspirational purchase by the poorest households. San Francisco-based Fenix International has created a partnership for distributing its solar kits with the Uganda mobile phone operator MTN, whereby MTN imports, warehouses, distributes and assists in servicing devices, in return for increased revenue made possible by its customers' access to electricity.
- **Solar home systems:** Solar home systems are a comprehensive energy solution for poor households and come equipped with a permanent photovoltaic panel installed on a roof or attached to a pole. These start in the \$300–\$500 range and have the capability to power large appliances. They require professional installation and regular maintenance but can last from 15 to 30 years with no operating costs. Solar home systems have taken off in Bangladesh, spurred by major producers such as Grameen Shakti. From 2000 to 2010,



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Photo by Alex Irvin



“The good news is that in 2011 global investment in renewable energy was \$187 billion and for the first time in global history, it exceeded investment in traditional sources of energy by 20 percent.”

— **Viswanathan Shankar**
*Group Executive Director and CEO,
Europe, Middle East, Africa and Americas,
Standard Chartered Bank*

solar home systems’ penetration of Bangladesh’s unserved population grew from less than 1 percent to 40 percent.

- **Minigrids:** Minigrids are small-scale and decentralized power systems that provide electricity to poor communities that are not connected to a central grid. Customers for one minigrad can range in number from as few as 10 to several thousand. Minigrads can be operated using a range of sources, including diesel, hydropower, biomass, photovoltaics and wind. Cambodia’s Vihearsur Electrify Enterprise, for example, supplies power profitably to 1,760 customers 24 hours a day in a district outside Phnom Penh for about \$8.44 per month each.
- **Grid extension:** Efforts to expand access to centralized electricity grids for poor households in urban, peri-urban and rural areas usually depend on reshaping the service to serve low-income customers. This may include the installation of prepaid meters, allowing flexible payment, and offering consumer finance. Efficiency gains and theft prevention can improve the financial viability of these initiatives. However, purely commercial models remain rare, and the most prominent examples benefit from strong public support and smart subsidies. For instance, in Brazil, CEMAR, the private utility serving the State of Maranhão, succeeded in extending access by 50 percent to the poor with help from a public program called Luz para Todos, which supported approaches to increasing access that had the lowest cost per capita. ■

Photo by Alex Irvin



“Developing countries are far from hostile to greening their economies. The questions they’re asking are: How? What are the means of implementation? And specifically, how do we fund this transformation? How do we develop the capacities for it? How do we access the technologies that we’re talking about, which make transformation possible? And I think having convincing answers to these questions really lies very much at the heart of 21st century development.”

— **Helen Clark** [@HelenClarkUNDP](#)
Administrator, United Nations Development Programme



Photo: International Finance Corporation