4. Enhancing Country Approaches and Scaling Up Access

Highlights

- In low-access countries, a quantum leap in the pace of new connections and in levels of investments will be necessary to reach the goal of universal access within the next 15 years.
- Successful country experiences in rapidly scaling up access suggest important driving factors: comprehensive planning of the national electricity access rollout; ensuring financial viability of the electricity sector; and addressing affordability, equity, and inclusion through targeting the poor.
- The Bank Group's first sectorwide programs in the electricity sector, in Rwanda and Kenya, led to significant financing commitments from development partners, including the private sector, and show promising results.
- The Bank Group collaboration, including joint projects, in low- and medium-access countries is notable. But there is no evidence to verify the value added and cost and benefits to private sector clients.

This chapter begins by reviewing the rate at which country clients increased electricity access in recent years. It then presents indicative estimates of the pace of connections and resources needed by the countries for transmission and distribution (T&D) and associated generation to achieve universal electricity access by 2030. This is followed by an assessment of the Bank Group's support for nationwide efforts to expand access through coordinated grid and off-grid rollouts. It also assesses the Bank Group's knowledge and operational support for sector-level institutional frameworks and processes for organizing, planning, financing, and implementing a programmatic effort for achieving universal access targets. Finally, the chapter reviews the internal synergy between the units of the Bank Group as a crucial element in any future strategy in support of universal access. Taken together with the findings of chapters 2 and 3, the evidence and analysis points to the need for a paradigm shift in the Bank Group's approach to scaling up connections in low-access countries to make credible progress toward achieving the Sustainable Energy for All (SE4All) goal, especially in Sub-Saharan Africa.

The Challenge of Achieving Universal Access

The implementation rate of new electricity connections in country clients during 2000–2010 falls well short of what will be required to achieve universal access by 2030 (table 4.1). In particular, low-access countries added 2 million connections per

year during the period, and will need to raise this rate at least sevenfold and maintain it for the next 15 years to achieve the SE4All goal by 2030.

Table 4.1. Required Pace of Electricity Connections to Achieve Universal Access by 2030

Country electricity access category	Average connections added per year, 2000–2010 (millions)	Average Bank Group–supported connections per year,[a] 2000–2014 (millions)	Average connections required per year for universal access,[b] 2015–2030 (millions)
Low	2.0	0.1	14.6
Medium	6.2	0.2	6.7
High	3.1	0.1	3.2
Universal	5.2	0.3	5.2
TOTAL	**16.5**	**0.7**	**29.7**

Source: UN 2012; World Development Indicators; IEG estimates.
a. Connections compiled from project performance indicators; does not include imputed connections from additional generation capacity supported by the Bank Group.
b. Assumes average annual growth of connections during 2000–2010 continues until 2015; factors in population growth.

Medium- and high- access countries are likely to come close to universal access by 2030. For medium-access countries, the annual rate of new connections will need to rise from 6.2 million to 6.7 million, and high-access countries will need 3.1 million to 3.2 million; these rates would need to be maintained for the next 15 years. The Bank Group will continue to have a significant supporting role in this effort, particularly in addressing growing adequacy and reliability issues in medium-, high-, and universal-access countries.

Table 4.2 underscores the daunting investment financing gap for achieving adequate, reliable, and affordable universal electricity access in low-access countries by 2030. The incremental investment required in low-access countries for access scale-up—T&D extensions and generation capacity required to serve the demand from the new connections—is estimated to be about $17.1 billion per year, which includes $11.9 billion for T&D and $5.2 billion for generation (table 4.2).[1] By comparison, during 2000–2014, the average annual investment financing was about $3.6 billion from principal sources (multilateral banks and donors, together with government counterpart funding and private sector investments), including $1.5 billion per year from the Bank Group (table 4.2). Note that these estimated requirements are in addition to the investments required for refurbishing existing electricity infrastructure, which is generally in poor condition in low-access countries. Adding generation capacity to meet current suppressed demand and keeping up with demand from projected economic growth will cost an estimated $20 billion per year for several years in low-income (and largely low-access) countries in Sub-Saharan Africa alone (Foster and Briceño-Garmendia 2011). Specifically, the estimated investment requirements for 2015–2030 for low-access

countries in Sub-Saharan Africa to achieve universal access by 2030 is about $17 billion, and to satisfactorily address power supply inadequacy and shortfalls experienced in many countries and to meet projected demand from economic growth would be about $37 billion per year, of which $12 billion is for T&D and $25 billion is for generation.

Table 4.2. Projected Investment Needs for Achieving Universal Access by 2030 versus Historical Investments in the Electricity Sector (annual average, $ billions)

Country electricity access category	Bank Group[a] 2000–2014	Other multilateral banks and donors, 2000–2010	Private sector, 2000–2013	Total investment 2000–2014	Projected investment needs for universal access, 2015–2030[b]		
					T&D	Generation	Total
Low	1.5	1.3	0.8	3.6[c]	11.9	5.2[d]	17.1
Medium	1.9	1.2	10.3	13.3	5.5	2.3	7.8
High	2.0	2.3	4.7	8.9	2.6	1.1	3.7
Universal	3.7	5.2	23.2	32.0	4.3	1.8	6.1

Sources: World Bank Business Intelligence; IFC and MIGA databases; AidData database; Public-Private Infrastructure Advisory Facility (PPIAF).
Notes: Data excludes technical assistance, economic and sector work, and advisory services. PPIAF data covers 2000–2013 only; AidData covers 2000–2010 only. This table excludes data on the government's own financing of power sector projects, FDI, EXIM Bank financing, and some concessional government-to-government loans. T&D = transmission and distribution.
a. Includes counterpart funding.
b. IEG estimates of incremental investment for access scale-up only; assumes average $800 per connection; adds 46 percent for generation and transmission (World Bank 2010a).
c. Of which about 50 percent is estimated to be for generation capacity.
d. Does not include annual investment needs in the early years for refurbishing existing infrastructure; adding generation to meet suppressed demand; and demand from economic growth estimated at $20 billion per year for several years starting in 2015.

The preceding analysis of resource needs for universal access for low-access countries uses indicative estimates that are not intended to be precise, but instead indicate the order of magnitude of the additional resources that will be needed for this effort. A main implication from this analysis is that the immense gaps in investment financing under the SE4All targets cannot be met without large-scale private sector involvement, especially in investments for generation capacity to meet new and suppressed demand, ensuring power supply adequacy and reliability to acceptable standards of practice and powering electricity demands from economic growth. Simply continuing the Bank Group's practice of mobilizing resources on a project-by-project or transaction-by-transaction basis cannot be expected to be transformative by itself. On average, for every $1.00 of the Bank Group's own

commitments to the electricity sector in the past 15 years, Bank Group projects mobilized an estimated $1.30 from government counterpart funds, co-financers, and co-investors (table 4.3). This ratio is even lower for low-access countries, at $0.80 for every $1.00 of Bank Group commitments. Given competing demands from other sectors, it is unlikely that the Bank can increase its contribution or counterpart funding to the electricity sector by an order of magnitude that can make a significant dent in the resource gap facing low-access countries that want to achieve universal access.

Table 4.3. Bank Group Efficiency in Leveraging Electricity Sector Resources, FY2000–2014

Country access category	Amount leveraged[a] per dollar of Bank Group commitments ($)
Low	0.80
Medium	1.70
High	1.60
Universal	1.20
ALL	**1.30**

Sources: World Bank Business Intelligence; IFC and MIGA databases; AidData database; Public-Private Infrastructure Advisory Facility.

a. The above numbers are illustrative of aggregate WBG's leveraging efficiency and were estimated by deducting the amount of WBG support from total project costs. The leveraged amount includes government counterpart funds, co-financing, and co-investments.

The preceding analysis points to the need for mainstreaming radically new and different approaches to complement existing practice that would help syndicate investments on a larger scale than is possible through the current project-by-project approach. The syndication efforts would need to be differentiated for T&D, which remains largely in the domain of the public sector, and for generation, where the private sector has and must have a far larger role. Recent and ongoing World Bank experience with sectorwide frameworks and processes that aim to do this are assessed later in this chapter.

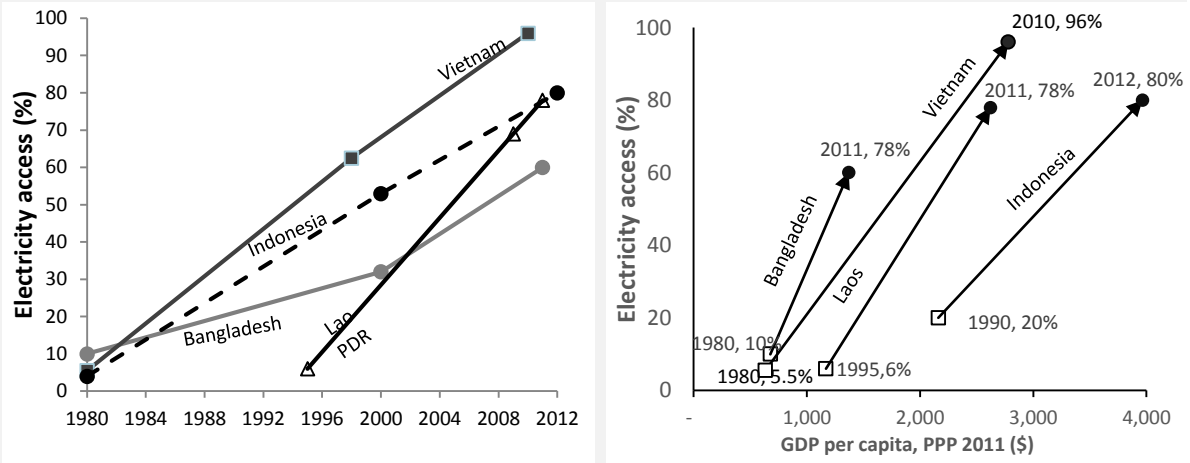
Bank Group–Supported Good Practices for Scaling up Access

Against the background of the preceding discussion, this section highlights the Bank's experience in advancing good practice in selected national country programs toward universal access—grid and off-grid—and their implications for low-access countries, especially in Sub-Saharan Africa.

Figure 4.1 shows the steep gradients of access implementation for four countries over time. Indonesia (Gencer and others 2011), Lao PDR (World Bank 2012b), and

Vietnam (Gencer and others 2011) scaled up from low access levels to connecting the vast majority of their populations to electricity within two decades. Today, electricity access levels are at 80 percent in Indonesia, 83 percent in Lao PDR, and 96 percent in Vietnam, compared to 53 percent in 2000, 6 percent in 1995, and 5.5 percent in 1980, respectively. All these countries achieved this access level despite starting with low gross domestic product per capita, comparable to or even lower than that of several low- and medium-access countries in Sub-Saharan Africa today (figure 4.1). With the Bank Group's ongoing support, Bangladesh achieved a remarkable expansion of off-grid SHS, which quickly brought basic electricity services to nearly 10 million people over the last decade, and is filling the void left by the stalled grid expansion and generation shortages in the country.

Figure 4.1. Rapid Transitions from Low to High or Universal Access, Beginning from Low-Income Levels (GDP per capita)



Sources: Electricity access: UN 2012; GDP per capita: World Bank World Development Indicators.
Note: GDP = gross domestic product; PPP = purchasng power parity.

In all cases, the governments owned the access effort and incorporated it in their growth strategies. Indonesia's national utility, PLN (Perusahaan Listrik Negara), historically achieved about 2 million grid connections per year; in recent years it ramped up connections with government support and financing to well over 3 million per year, most of which are in rural areas scattered across the country's 3,000-mile-long archipelago of several thousand islands. Lao PDR integrated its national electrification in a broader strategy of national development. The government set specific targets for electricity access—70 percent by 2010 (which was exceeded) and 90 percent by 2020—to be achieved through aggressive grid extension complemented by off-grid electrification where cost-effective. In Vietnam in the 1990s, about half of the rural communes and less than 15 percent of rural households had access to electricity. In response, the government made rural electrification a component of its

development strategy to provide households with lighting and improved health care, education, and economic opportunities.

Vietnam and Lao PDR both had to overcome weak institutional arrangements. In Vietnam, almost 90 percent of rural electricity distribution was carried out by commune-level electricity groups—supported by the national utility, Electricity of Vietnam (EVN) —that had no legal status, minimal technical competence, and little financing. Regulation of the power sector was grossly inadequate, lacking an effective legal and regulatory framework and technical standards for rural electrification. The government formulated a phased long-term electrification plan that during the initial years focused on physically connecting rural communes rapidly, and it attracted broad local participation. Starting in the mid-2000s, a second and ongoing phase of the plan focused on improving efficiency and reliability of electricity supply through more efficient technical operation. In Lao PDR, the national electricity utility EDL (Electricité du Laos) was held accountable for annual targets for grid-based access expansion. The government, meanwhile, followed up with the policy and financial commitments necessary to manage the balance between ensuring affordability of electricity connections to the vast majority of the population while remaining sensitive to the need to strengthen EDL's financial health and sustainability to deliver the grid extension program on time.

For Lao PDR, hydropower export revenues helped finance the startup and the early stage growth of the national electrification program. Visionary and opportunistic developments of hydro projects were pursued during the late 1970s and early 1980s. These projects were driven by export sales to nearby Thailand markets, coupled with negotiated arrangements for power buyback or exchange arrangements, where feasible, for electrification of border areas. The revenues from these projects enabled financing of the early hydro projects, and financing the national power expansion and connections program. Starting in the late 1980s, government reforms encouraged the participation of independent private power providers (export hydro IPPs) and led to the significant private investment underlying installed power capacity today, with several more projects in the pipeline.

Vietnam and Lao PDR created a common sector-level platform by planning and phasing access expansion while providing stable sector policies and regulation. The platform was led by their governments and anchored by a national electrification rollout plan aligned to national priorities and targets. It was designed to orchestrate systematic expansion of access through a sustained program supported by donors who financed large-scale access improvement instead of using a door-to-door, project-by-project mode of sector investments. The Bank Group's support for Vietnam's electrification spanned nearly two decades from 1995, providing about $3.3 billion in

investment lending to support $4.1 billion in projects that built and rehabilitated T&D networks together with other lenders, including the Asian Development Bank and the Japan International Cooperation Agency. The Bank has also provided $700 million through a series of three development policy operations (DPOs). In Lao PDR, the government's approach led to strong, longstanding donor engagement and support—finance for the national electrification program investment and knowledge to help the government implement sector reforms, strengthen institutions, and improve sector performance and efficiency. The major grid extension projects sponsored by multilateral institutions during 1987–2009 provided an estimated $450 million, of which about $400 million was for grid investment, $5 million for off-grid investment, and about $25 million for institution building. Given the limited IDA allocations, the World Bank's role was important for mobilizing resources from the Global Environment Facility, Norway, and Australia for rural electrification, and from various trust funds for project preparation.

Bank Group Experience with Off-Grid Expansion

The Bank Group portfolio during the past 15 years displays a range of off-grid electrification experience—in technical delivery modalities and standards, and context-specific institutional frameworks. Notable among these are instances where off-grid provision, particularly deploying solar home systems (SHSs), proved to be commercially viable on a freestanding basis and rapidly scalable in a sustainable manner. These experiences span pre-electrification in grid-proximate areas, regions that are permanently off-grid because of remoteness or difficult accessibility, and in portable cash-and-carry retail solar products for lighting and charging cell phones (box 4.1). The following assessment of various Bank experiences in off-grid electrification shows scope for replication as appropriate in different country or sub-regional contexts. The experience with geospatial planning models that enable the coordinated growth (with the grid expansion) of off-grid electrification is covered in the discussion on sectorwide frameworks and approaches to electrification.

Box 4.1. Off-Grid Electrification in a Nationwide Least-Cost Electrification Strategy

Off-grid electrification that is well coordinated with grid-based electrification is an essential part of a nationwide least-cost electrification strategy (World Bank 2011a). Experience backed by technical and economic analysis shows that in most country contexts, conventional grid extension is generally the most cost-effective means of electrification for most populations in light of the geospatial settlement patterns and density.

However, the unit marginal costs of grid extensions inevitably increase as the grid spreads further out and extends its reach into less populous and more distant areas with lower settlement density and typically lower demand. These costs eventually surpass the unit costs of decentralized delivery modalities such as a mini- or micro-grid (an isolated small generation unit feeding a local network in a compact footprint) and individual units such as solar home systems (SHSs). Increasingly, with the continuing and significant declines in unit costs of some new technologies (especially solar panels) coupled with increasing penetration of mobile banking services, off-grid options such as SHSs offer a fast and cost-effective alternative for meeting high-valued electricity needs.

Outside of grid extensions and coordinated off-grid access scale-up efforts, the fast-growing markets are in filling the gaps in demand for modern energy services, which includes retail, off-the-shelf portable solar charging and lighting products that replace candles, kerosene, or flashlights. These are a major improvement in both the quality of services and costs until the user can get access to an SHS, a mini- or micro-grid, or the main grid. Off-grid solutions provide a critical and transformative first step with basic energy services such as lighting, mobile phone charging, fans, and television. Instead of waiting for all energy needs and the full range of electricity services to be met at once through grid extension, off-grid interventions help get populations on the energy ladder on a time scale that accelerates impact: days and months, not the years and decades they often must wait for centralized power plants and grid extension.

IEG identified and reviewed 47 World Bank projects (20 of which are active) approved since FY2000 that focused on or included off-grid components. These were implemented in 33 countries (15 low access, 5 medium, 9 high, and 4 universal). The list of these projects and financing amounts is in appendix G. Across this set of projects, the World Bank supported several business models and institutional frameworks for off-grid electrification, principally the vendor model and the concession model for SHS. The vendor model, initially tried in Sri Lanka with SHSs, was adopted on a far larger scale in Bangladesh and was tailored to the sector context there. The concession model was used with good results in the electrification of remote and hilly regions of Argentina and Peru. Although the focus in this section is on learning from successful off-grid experiences supported by the Bank Group, as discussed in chapter 2, the Bank Group's less successful experiences in other countries are also reviewed.

WORLD BANK EXPERIENCE WITH SUPPORT FOR PRE-ELECTRIFICATION

Sri Lanka's Bank Group–supported Renewable Energy for Rural Economic Development program was a proving ground for the vendor model of private sector–led off-grid renewable energy development (IEG 2014d). The program was initially hosted in the public sector Development Finance Corporation of Ceylon with a number of credit institutions and private solar vendors participating in the market, selling about 13,000 SHSs per year at the peak of the program. However, with the

faster-than-expected expansion of the electricity grid in Sri Lanka, demand for SHSs declined, though there is still scope and interest in SHS expansion in some regions of the country.

The vendor model got much more traction in Bangladesh in the past decade through the Bank's Rural Electrification and Renewable Energy Development Project (RERED), even though the impetus for this was largely from the stalled main grid extensions and connections rollout program exacerbated by a severe shortfall in electricity generation in the country in the past decade. The Bangladesh off-grid experience is exemplary in many respects, including the attention paid to institutional arrangements, private participation, quality control, maintenance arrangements, and financial provisions to make the SHSs affordable to the beneficiaries. Bangladesh's rapidly scalable off-grid access expansion can be viewed as pre-electrification, a second-best solution for areas that otherwise could be covered cost-effectively by centralized grids. The Bangladesh experience, described in box 4.2, holds promise for low-access countries, especially those in Sub-Saharan Africa where the main grid sector institutional frameworks and other conditions have not advanced sufficiently to undertake a systematic grid extension rollout with matching generation capabilities.

Bangladesh's vendor-based program built upon a first generation effort by the Bangladesh Rural Electrification Board using a fee-for-service approach to deploy SHSs. The scheme did not fare well since it was not cost-effective for the board (and the associated rural electric cooperatives) to undertake bill collection or perform maintenance in dispersed locations. A lack of user ownership of the SHS asset resulted in neglect and even abuse of the installed systems. Additionally, out of seven mini-grids originally planned in the project (accounting for less than 1 percent of the RERED project cost), only three were attempted, of which only one remains in operation. In this case, the lack of a clear regulatory framework for remunerative tariffs and compensation for stranded assets appears to have deterred investors (IEG 2014d). These experiences, when contrasted with the vendor model employed by Infrastructure Development Company Limited, highlight the importance of appropriate institutional and financial arrangements, program design, and incentives for all stakeholders to make off-grid electrification a viable proposition.

Box 4.2. Bangladesh's Experience in Off-Grid Pre-Electrification

Bangladesh's 2002–2013 Rural Electrification and Renewable Energy Development (RERED) Project, supported by the World Bank, notably contributed to social and economic outcomes in rural areas by extending access to electricity through off-grid SHSs, supplementing the extension of the electricity grid. The project and its ongoing successor, RERED II, helped install SHSs on a scale that far exceeded original targets, topping about

2 million by end of 2014, when grid expansion was slowing. The country installed about 100,000 SHSs a month in 2014.

This off-grid experience demonstrated the potential scale and speed at which off-grid facilities can bring connectivity to households. In a relatively short time, an SHS can bring electricity to a household in a rural or remote area that would otherwise have to wait years for the grid to reach it with the promise of more comprehensive services.

The program was managed by Infrastructure Development Company Limited (IDCOL), a semi-governmental infrastructure finance organization, which worked through nongovernmental organizations (NGOs) and demonstrated the feasibility of having beneficiaries pay for a substantial portion of the SHS asset in affordable installments. The program started with five NGO partners with an initial target of installing 50,000 SHSs. By the end of 2014, 49 partner organizations were installing SHSs under a competitive business model. IDCOL also helped mentor and develop the partner organizations.

IDCOL's solar program effectively managed its after-sales network through its partner organizations. To ensure quality standards, the commercial participating organizations—NGOs, microfinance institutions, and private sector institutions—purchase solar panels, batteries, and other components approved by a technical standards committee. Vendors submit required documents, warranties, and product-testing certificates to the committee for examination and approval. Once the products are approved, the participating organizations can buy them directly from the vendor and set up their own terms of purchase and payment. The participating organizations arrange for user training in operations and maintenance, regular after-sale services, and timely handling of customer complaints. IDCOL routinely inspects the installed systems and shares its findings with the participating organizations.

Source: IEG 2014a.

SUPPORT FOR REMOTE-AREA ELECTRIFICATION

Bank Group projects also provided some countries with support to bring off-grid electricity to sparsely populated, remote, or mountainous areas that are unlikely to be covered by the conventional grid. Of particular interest is the concession model employed in the outlying areas of Peru and Argentina—countries with high electricity access.[2]

Argentina's Renewable Energy in Rural Markets Project (1999–2012) supported an early fee-for-service concession model to supply electricity to remote areas.[3] The model worked well given Argentina's long experience with concessions in traditional electricity markets. The project developed eight concessionaires that installed off-grid facilities in nearly 30,000 households—mainly with SHS but also with wind turbines and mini-grids—in addition to installing more than 2,000 SHSs in schools, medical centers, and other public buildings (World Bank 2013a). The relatively large unit size of the institutional installation and mandated installation

(as opposed to individual households that may not opt to sign up) greatly increased the attractiveness of the package to private sector bidders. Similarly, under Peru's Rural Electrification Project (2006–2013), electricity distribution companies installed more than 100,000 SHSs in remote and isolated areas.[4] Though considerably lower than the project's goal of 160,000 connections, the target of increasing electricity consumption for productive uses by 18,000 megawatt hours in the first five years was exceeded by 1,107 megawatt hours. The Bank Group's role was important in supplementing the financing plan, particularly in supporting capital investments and helping ensure transparency in awarding concessions.

In another example of providing off-grid solutions to thinly spread out (and in this case distributed) herder populations, Mongolia's Renewable Energy for Rural Access Project enabled distribution and sales of nearly 70,000 SHSs, covering more than 60 percent of the country's herder population.[5]

In Nicaragua, insufficient attention to commercial arrangements for selling surplus power to the wholesale market during preparation and design of the Off-Grid Rural Electrification project resulted in underperformance of small hydro facilities.[6] After Lao PDR's Southern Provinces Rural Electrification project, a survey revealed that more than 80 percent of the 6,000 SHS were not working properly because of low levels of maintenance.[7] In Mali's Household Energy and Universal Access project, there was weak community demand for stand-alone SHS because the products sold were of low quality and capacity, and maintenance services were substandard.[8] This contributed to the underachievement of project targets for SHS installations by a substantial margin. There was little activity with isolated mini-grids in World Bank projects. As previously noted, the planned mini-grids in the Bangladesh RERED project did not get off the ground. In Vietnam's System Efficiency Improvement, Equitization, and Renewables Project, serious quality problems surfaced during construction and rehabilitation of the mini-hydropower plants planned under a small component, and their relevance was eventually overtaken by a faster-than-expected advance of the grid.[9] The search is still on for commercially viable and scalable mini-grid network models, but there have been no significant results so far.

PRODUCTIVE USES OF OFF-GRID ELECTRICITY

The use of off-grid electrification is mostly dedicated to lighting, comfort, entertainment, and communication. Combining off-grid projects with interventions to promote local productive uses of electricity, as in the Peru case cited previously, is expected to catalyze economic activity and improve incomes. The Mexico Renewable Energy for Agriculture project demonstrated the considerable developmental benefits of promoting productive uses of off-grid electricity by addressing the lack of awareness and risk aversion of potential beneficiaries, and the

lack of trained technicians and standardized specifications.[10] Survey results showed that more than 2,300 farmers who did not have electricity connections previously were provided with a reliable supply (through photovoltaic pumping systems) and thus had refrigeration for milk and fish, which contributed to substantial increases in the beneficiaries' incomes. Under the Lao PDR Southern Provinces Electrification Project, 81 households in Nonsal village reported a 50 percent increase in income from the additional time spent on making handcrafts since SHS were installed.[11]

SOLAR OFF-GRID LIGHTING PRODUCTS

The Lighting Africa program, a joint initiative of IFC and the World Bank, was launched in September 2007 with the goal of catalyzing retail markets in Sub-Saharan Africa for clean, modern, off-grid lighting and charging products (mainly portable solar lamps, some with attachments for charging cellphones and radios). In IEG's assessment, the program is a relevant and innovative approach to meeting the needs of targeted countries, and it made important contributions to the growth of the Region's market for private sector-supplied portable off-grid lighting products. The main drivers of the program's performance were its provision of quality certification and testing infrastructure, and market intelligence. Its focus on unsubsidized market-based approaches has considerable replication potential (box 4.3).

Lessons from the good practice country examples highlighted in the preceding sections (Bangladesh, Indonesia, Lao PDR, and Vietnam), along with those from other earlier, successful country programs and from cases when the World Bank Group was not a major player (notably Brazil, Mexico, Thailand, and Tunisia) point to certain primary drivers of success. These drivers are common across the countries' national electrification program records of achievement toward universal electricity access, but not across the specific institutional models for their achievements.

Box 4.3. The Lighting Africa Program

The Lighting Africa program supports the rapid scale-up and delivery of affordable, quality lighting products, mostly basic solar lanterns (Pico PV or a small PV-system with a power output of 1 to 10W) predominantly for household lighting. Against the backdrop of generally serious product quality difficulties in the region, Lighting Africa addresses quality assurance, market intelligence, business support, access to finance, consumer education, policy, and regulation to help participating governments create an enabling environment for off-grid lighting and integrating it into their national electrification plans.

Lighting Africa implemented four IFC projects and five World Bank projects, with three IFC projects in the pipeline. Lighting Africa reports that it helped lighting products reach nearly 7 million people—an achievement far surpassing the program's initial goal of 2.5 million beneficiaries by 2012. To date, 49 products met or surpassed the program's quality

and performance standards, with more than 1.3 million sold in 20 African countries. The Sub-Saharan African countries where quality-certified solar lanterns are sold increased from 5 to 10 in 2010, and to 20 in 2012, and the number of certified manufacturers grew from 6 to 25 in the same period. To put these achievements in perspective, the program has reached about 2.5 percent of its potential market in Africa.

Although the full extent of the program's contribution to the spread of solar lighting products cannot be established, a stakeholder survey attributed 30–60 percent of all quality solar lighting products to the program (in Kenya and Ghana, where the program was piloted). This suggests that the program's impact is substantial.

The experience of the Lighting Africa program led to programs in Bangladesh, India, and Papua New Guinea, with more programs being developed in Pakistan and Indonesia. The program is now part of the expanded Lighting Global program, which supports Lighting Africa, Lighting Asia, and Lighting Pacific, and which works along the supply chain of off-grid lighting products and systems to reduce market entry barriers and first-mover risks.

Sources: IEG assessment; Castalia 2014.

Countries' electrification succeeded through a homegrown institutional structure and framework of implementation and accountability considered appropriate for their country contexts and circumstances, as revealed by country-specific reviews undertaken by the Energy Sector Management Assistance Program (ESMAP) and other reports (World Bank 2011a). Most high-access achievers in Asia used their national utilities and other public institutions as the main agents for scaling up electricity access; by contrast, several Latin American nations relied on their privatized utilities as primary agents (for example, Argentina, Brazil, and Peru). In some instances, publicly owned distribution cooperatives had a major role in scaling up access, notably in Bangladesh, Costa Rica, the Philippines, and Vietnam (commune electrification councils). Furthermore, the lessons indicate that neither the publicly owned entities nor private sector alone can marshal the capacity, financing, quality, and policy needed to scale up access efficiently, effectively, and sustainably. Another common feature across the good practice country programs is their use of some form of targeted public subsidies—especially for the T&D investments—for ensuring affordability of retail electricity tariffs and customer connection charges to the poor.

The core organizing principles and strategic drivers of successful performance common across the large and diverse spectrum of country contexts and experiences described above—including differences in sector structures, regulatory frameworks, and enabling policies—can be broadly stated as follows:

- Develop a least-cost, comprehensive national electrification rollout plan that is consistent with the national development vision and has government

ownership; uses an appropriate combination of grid and off-grid solutions that will enable economic growth and modernization; and that sets access targets that include household connections and connections for service delivery institutions (health and education), business and commerce, and other enterprises.

- Establish clearly delineated roles and accountability for sector performance and results to ensure efficient and effective management and operation of the sector.
- Ensure the ongoing commercial viability of the delivery agents during the program implementation period, while also ensuring customer affordability, especially for the poor.
- Promote equity, inclusion, and shared prosperity through a well-targeted rollout to ensure affordability of the service for the poor and disadvantaged across geography and time.
- Establish a consultative framework and process that is government-led and facilitates sustained engagement in the sector—recognizing the long-term programmatic nature of the implementation and financing challenge.
- Use a sectorwide organizing architecture guided by the principle of "many partners, one team, one plan," and aim to rally the participation of designated sector agents and key stakeholders. This approach can also help to increase the degree of harmonization in donor participation.

Sectorwide Engagement for Nationwide Access Rollout

This section highlights notable experiences from Rwanda and Kenya, both low-income countries that are implementing sectorwide programs to scale up national access. A key driver of the positive and encouraging experience and results from these programs was the government's ownership, early commitment, and persistent follow-through on the enabling actions established in Investment Financing Prospectuses. Each program is anchored by a least-cost geospatial national electrification rollout plan for grid and coordinated off-grid development for universal access by 2030. Hence, the programs exemplify many of the principles described in the preceding section. In both instances, the Bank is continuing to assist the government.

The Bank supported the governments' efforts to mainstream a framework for sectorwide investment financing to syndicate sufficient financing to support ongoing implementation of the program. An important point in this framework is recognition that the overwhelming share of the investment financing—for sub-transmission and distribution and for off-grid rollout—must come from other sector agents and participants, not from the Bank's sectorwide approach instrument of

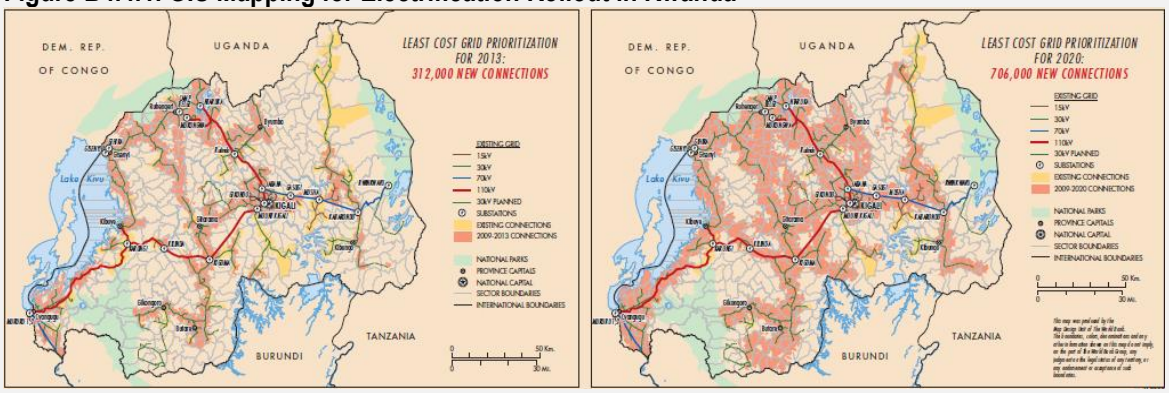
budget support. The Bank deployed a sector investment loan and a supplemental operation to intermediate its own commitments, and most other donors use their own instruments to provide their share of financing support of the access rollout program.

The Bank's engagements began in 2007 for Kenya and 2008 for Rwanda. The first major step for each was preparation of a national geospatial access rollout plan that combined geographic, demographic, and technical parameters to scale up access in a least-cost and time-bound manner. The plan addressed equity and shared prosperity considerations through policies for keeping connections charges affordable for the poor; a substantial off-grid program gave priority to connecting public facilities (schools, clinics, primary health centers, and administrative centers) so that developmental impacts could be spread out even ahead of the progress on household connections (box 4.4). The plans were funded by ESMAP as knowledge products that would be translated into operations.

Box 4.4. Rwanda Geospatial National Electrification Rollout Plan and Investment Financing

Rwanda is among the first countries to prepare and implement a nationwide electrification program combining grid and off-grid means, based on a systematic and least-cost plan aided by geographic information system (GIS) mapping techniques that combine technical, economic, demographic, and demand and supply data. The rollout plan can be updated with new information and offers several advantages over traditional Electrification Master Plans, as follows:

Figure B4.4.1. GIS Mapping for Electrification Rollout in Rwanda



Source: World Bank maps unit.
Note: GIS = geographic information system.

- Geospatial planning is easier to visualize for all stakeholders and can rally financial participation. As experienced in Rwanda and Kenya, the geospatial plan effectively anchored a "prospectus" for large and diverse groups of national and international stakeholders to coordinate and commit to an adequate and sustainable financing package.
- It speeds up wider developmental impact. The geospatial plan captures a national development perspective across all sectors (health, education, administrative

centers) and all households (urban, peri-urban, rural, and deep rural) and is not restricted to a "rural electrification project here and there" planning framework. Geospatial planning helps identify the off-grid interventions that are best in each area.

- Modest cost and ability to make frequent updates make it a dynamic planning platform. The geospatial plans for Rwanda and Kenya each cost about $1 million and took one year to prepare. They better capture the ever-changing situation (growing grid extensions, changing demand and affordability, equipment costs) to inform the implementation process. By contrast, classic Electrification Master Plan studies take two to three years and more than $2 million to prepare, and are based on a static framework.

Source: World Bank 2011a.

As part of the process, each country prepared a prospectus detailing the national electrification rollout plan. The prospectus stated the governments' commitments to sector policies and regulations for ensuring the financial viability of the sector and service providers. It also specified the financing requirements for each element of the program—generation, T&D, off-grid facilities, and others—in a phased manner for the next 15 years. These prospectuses were presented to donor groups in 2009 for Rwanda and 2010 for Kenya.[12]

The Rwanda and Kenya programs are similar in spirit to a compact and code-of-engagement understanding entered into by donors at the outset. They do not incorporate traditional tariffs or other such covenants, nor do they use explicit trigger and tranche mechanisms like a DPO instrument. Instead, the Investment Financing Prospectuses the government presented to donors to syndicate the projected financing gap were prepared with the upfront understanding that the bankability of the Prospectus would hinge, among other expectations, on retail tariffs that would, at minimum, cover all open and all capital expenditures upstream of sub-transmission required for grid supply.

Government commitment and ongoing involvement at the highest levels and from the earliest stages was crucial for the preparation of a sectorwide framework and process. The Rwanda and Kenya governments were involved throughout the design and preparation of the national program and geospatial plan. The governments drew up clear results frameworks and established monitoring and evaluation accountability under the overall institutional setup. To maintain the financial viability of the sector and ensure the commercial viability of the national utility, public subsidy funds were targeted to financing the gap between revenues recovered from retail tariffs set by the regulator, and revenues from affordable connection charges to new customers; the sub-transmission and distribution investment costs of grid rollout and all recurrent costs of the distribution operations were also offset; in other words, all capital and operating expenses upstream of

primary distribution are recovered in the cost of bulk power supply coming into the distribution network and all operational expenditures within the distribution system up to the customer meter. The shortfall in the utility's revenues from regulated tariffs under this scheme were reimbursed to the utility as a grant or as a soft loan.

Based on its prospectus, Rwanda syndicated financing of $340 million for the first five years with contributions from the Bank Group ($78 million), other multilaterals and donors ($185 million), and the government and national electricity utility ($77 million). A review of Public-Private Infrastructure Advisory Facility data (a database that records private sector investments) shows that $158 million was committed by the private sector for electricity projects in Rwanda during 2010–2011; the amount for the previous 10-year period was a mere $1.6 million (tables 4.4 and 4.5).[13] Kenya's prospectus helped raise $1.5 billion for 2009–2013 through a donor financing roundtable. Also, private sector flows of $1.38 billion came into Kenya's electricity sector since 2009 (table 4.4). Project staff, task team leaders, and stakeholders IEG interviewed in Kenya suggested that the private sector flows can be at least partly attributed to the donor response to the country prospectuses.

From tables 4.4 and 4.5, it is clear that the total amount syndicated for electricity access though the sectorwide programs is several times what might have been possible using a project-by-project approach. Specifically, in Rwanda, $78 million in Bank financing leveraged 4.5 times that amount from other public sector donors and stimulated twice the Bank's contribution from the private sector. The Bank Group's contribution directly or indirectly brought in $350 million from public sector or public sector funding sources, and an additional $158 million from the private sector, for an overall leverage of $6 for every dollar contributed by the Bank Group. The rations are similar for Kenya. This contrasts sharply with the leverage performance of the Bank Group (table 4.3) on a project-by-project basis.

Table 4.4. Rwanda Development Partner Pledges: Prospectus Donor Financing Round, 2009–2014

Development partner	Programmed donor contributions[a] ($, millions)
World Bank and GEF	**78**
Dutch government	45
Japan International Cooperation Agency (transmission and high-voltage stations)	25
African Development Bank	50
European Commission	35
Arab Bank for Economic Development in Africa (BADEA)	10
OPEC Fund for International Development (OFID)	10
Saudi Fund	10
Government contribution	50
Rwanda electricity utility (ELGZ)	27
TOTAL	**340**

Source: World Bank project documents.
a. Excludes committed generation investments in private sector or purchasing power parity.

Table 4.5. Private Sector Commitments to the Electricity Sector, FY2000–2013 ($, millions)

	Total 2000–2009	2009	2010	2011	2012	2013	Total 2009–2013
Kenya	338	127	–	170	887	200	1,384
Rwanda	1.6		16	142	–	–	158

Source: Public-Private Infrastructure Advisory Facility database.

The evidence available from the ongoing sectorwide programs shows impressive growth in access during 2009–2014 from 6 percent to 15 percent in Rwanda, and from 23 percent to 30 percent in Kenya (tables 4.6 and 4.7). Rwanda exceeded its original electricity access targets for 2014 and revised its target from 12 percent to 25 percent for 2016. By 2016 Rwanda also aims for 80 percent coverage of schools and universal coverage of administration centers, health centers, and hospitals (table 4.6). In 2003 the national utility, Kenya Power and Lighting Company, made 40,000 new grid connections per year, corresponding to less than 0.5 percent of the population. Performance indicator data from the ongoing Kenya Electricity Expansion Project and country sector statistics show that the rate of new connections added annually increased from 135,000 in FY2007–2008 to 443,000 in FY2013–2014 (table 4.7).

Table 4.6. Rwanda—Progress in Electricity Access and Connecting Service Delivery Institutions (percent)

Beneficiary category	2009	2012	2013	2014	Target: 2016
Overall access	6	–	–	15	25
Schools	21	–	–	37	80
Administration centers	39	–	–	59	100
Health centers, hospitals	38	–	–	57	100
Total connections (million)[a]	**0.11**	**0.33**	**0.39**	**0.43**	**Original : 0.37 Revised: 0.77**

Sources: ESMAP 2012c; Implementation Status and Results Reports, December 2013 and June 2014; Rwanda Electricity Access Scale-up and Sectorwide Approach (SWAp) Development Project (P111567).
a. Assumes five persons per household.

Table 4.7. Kenya—Progress in Electricity Access and Connecting Service Delivery Institutions

Year	FY2005–2006	FY2006–2007	FY2007–2008	FY2008–2009	FY2009–2010	FY2012–2013	FY2013–2014
Overall access	–	–	–	–	23%	–	30%
Connections added	~40,000	120,000	135,000	200,000	220,000	307,000	443,000*
Total connections (million)	**~0.80**	**~0.90**	**1.10**	**1.26**	**1.46**	**–**	**2.80**

* By June 2013, 23,000 of 25,873 trading centers, secondary schools, and health centers, were also connected to grid. Of this 6,065 were schools.
Sources: Bank Implementation Status Reports: October 2011, January 2013, and August 2014; Project Appraisal Document "Electricity Expansion Project" May 2010; Various statements by Kenya Power and Lighting Company and other officials and Briefing to Parliamentary Committee on Energy; Eddy Njoroge, former CEO Kenya Power and Lighting Company, presentation on Kenya Vision for developing Electrification Rollout Plan: Kenyan Experience, December 3–5, 2014, Port Moresby.

Collaboration among World Bank, IFC, and MIGA in the Electricity Sector

Collaboration across the Bank Group in the electricity sector is mainly through joint projects in which at least two of the World Bank, IFC, and MIGA are involved. The World Bank brings to this collaboration the value of its upstream work for country clients on policy and institutional frameworks, and the Partial Risk and Partial Credit Guarantee instruments to support government payment obligations to private investors. IFC brings long-term financing that is rarely available in countries with underdeveloped financial markets and high investor risk. MIGA's main value added in the joint transactions is from long-term political risk insurance for high-risk countries, which is not available from international commercial insurers.[14]

Bank Group–wide collaboration in the electricity sector has occurred for several years. IEG identified 25 projects with the involvement of at least two of the three institutions (listed in appendix M). Of these, nine are in low-access countries (Cameroon, Kenya, and Uganda); seven are in medium-access countries (Bangladesh, Côte D'Ivoire, India, Lao PDR, and Senegal); five are in high-access countries (Guatemala, Jamaica, Nepal, Pakistan, and Sri Lanka); and two are in universal-access countries (Tajikistan and Moldova). Bank Group engagement was higher in low- and medium-access countries ($3.4 billion) compared with high- and universal-access countries ($600 million). Also, IFC and MIGA financed projects in high- and universal-access countries without the need for World Bank involvement (table 4.8).

Table 4.8. Joint Projects in the Electricity Sector, FY2000–2014

	Purpose				Involvement			
Country access category	Number of projects	Generation: conventional	Generation: renewable, including hydro	Transmission and others	World Bank	IFC	MIGA	Total commitment ($, millions)
Low[a]	9	6	1	4	9	9	9	1,697
Medium	7	5	–	2	5	6	3	1,721
High	5	4	1	–	–	5	5	468
Universal	2	–	–	2	1	2	1	169
ALL	**25**	**15**	**2**	**8**	**17**	**24**	**18**	**4,055**

Sources: World Bank Business Intelligence; IFC and MIGA databases.
a. All in Sub-Saharan Africa.

Fifteen of the 25 projects addressed conventional generation (of which four covered large hydro projects); two addressed small new renewable energy projects, and two others involved privatization of distribution companies (Moldova and Uganda). Ten of the operations had less than $100 million each of Bank Group commitment; 14 had $100–500 million, and the remaining projects (Maharashtra State Electricity Transmission Company Limited and Nam Theun 2) had commitments of $1,050 million. Of the 25 projects, only 10 had been evaluated, of which nine projects have outcome ratings. Seven of these projects had development outcomes rated moderately satisfactory/successful or better. Two projects had less successful results because of the complexity of project design relative to the country's institutional capacity and experience in a joint IDA-IFC rural electrification project. The other joint IDA-IFC project fell short of meeting its objectives because of a change in government and limited IDA support compared with the ambitious objectives. (Bibiyana IPP; Bangladesh Power Sector Development Policy Credit).

The joint projects added value for country clients by breaking ground for the private sector in high-risk countries, and by pulling together financiers in large and complex projects, as is seen in the following examples.

Breaking ground for the private sector. At least six of the joint Bank Group projects were considered pioneering transactions in their respective countries including the first independent power provider in the country (Bangladesh, Cameroon, Jamaica), the first private or privatization of a power company or utility (Moldova and Uganda), or the first such transaction in the country (Guatemala). In the gas-to-power project in Cameroon, IDA designed a hybrid Partial Risk Guarantee (PRG) with a feature like an IBRD) Partial Credit Guarantee because the utility opted for a different procurement model. Without IDA financing and guarantee support, it would have been difficult to mobilize local banks to provide local currency financing and for the other international financiers to provide long-term debt. In the Umeme Limited project in Uganda, the relatively small IDA PRG covering a letter of credit supported by MIGA's political risk insurance helped large capital mobilization, including from IFC (box 4.5).

Box 4.5. Bank Group Collaboration in Transforming Uganda's Electricity Distribution: Lessons from IEG's Evaluation of Umeme Limited

Bank Group support for Umeme Limited, Uganda's privatized utility, is an example of how a "one Bank Group" approach can mobilize private investment, introduce efficiencies, and improve viability of a once underperforming utility in a post-conflict country. Through the provision of an IDA contingent credit and MIGA political risk insurance to support government guarantees, the Bank Group attracted first-rate private investors in the first fully privatized utility in Sub-Saharan Africa. IFC loans and equity investment provided additional lower-cost and long-term financing and helped catalyze financing for Umeme Limited's past and current $439 million 2013–2018 capital investment programs. Previous IDA credits also helped with other aspects of Uganda's power sector reform that had spillover effects on the project. Despite numerous challenges since its concession started in 2005, the Umeme experience showed that privatization of electricity distribution can introduce efficiencies, improve sector viability, strengthen the regulatory framework and capacity, and expand access.

Umeme exceeded the capital expenditures and collection rate improvements required under its 20-year concession agreement with the Uganda Electricity Transmission Company Limited. Electricity consumption in billed sales among the different customer types also increased. Household connections increased in its concession areas. Household electricity consumption increased from 334 gigawatt hours in 2004 to 455 gigawatt hours in 2012. Umeme had its initial public offering in 2012 and is cross-listed in the Kampala and Nairobi Stock Exchanges.

Source: Project documents.

Large and complex projects. Uganda's Bujagali hydropower project is one of the largest private sector operations in the Sub-Saharan Africa power sector, with a total cost of $800 million. In this project, IFC's substantial loan of $130 million and MIGA participation ($115 million) proved critical to financing $152 million of private equity,

and IDA's $115 million PRG supported the entire commercial financing package. For the Cameroon Kribi Gas-to-Power project, the Bank Group covered almost half of the $350 million project cost. The PRG enabled local banks to extend the maturity of their loans from the normal loan length of 7 years to the borrower's need for 14 years, improving the risk profile of the project to financiers. In Thailand, Nam Theun 2 Power Company is a cross-border project and was the World Bank's first major investment in hydropower after the World Commission on Dams report and the Bank's new water strategy of 2003. MIGA provided $200 million in coverage for the foreign equity holders. IDA's financial support was limited to a $20 million grant for social and environmental activities and a $50 million PRG to cover a small portion of the commercial borrowing. Although the IDA funding for this project was small compared with the total project cost, the Bank's appraisal was critical for bringing in other international financial institutions. Private participants, including Thai commercial banks, considered IDA and MIGA involvement essential because they provided critical risk mitigation comfort through their guarantees. Perhaps more important, their participation would ensure that the potential adverse social and environmental impacts of this category A (signifying substantial risks under the Bank's environmental and safeguards policies) would be fully addressed.

Intra-Bank Group parallel financing was hindered in the past by several issues, including the pledge of shares issue between IFC and MIGA, and the lack of familiarity among other Bank Group staff with MIGA's product and value added. Attempts to formalize intra-Bank Group collaboration, especially between IFC and MIGA, started in 2009 with the creation of a joint MIGA-IFC unit within IFC[15] to formalize cross-marketing and business referrals arrangements and a decision to re-establish MIGA field presence within select IFC/WB regional offices. This was followed by the resolution of conflict of interest issues and the joint business development agreement between IFC and MIGA[16]. The signing of a Claims Cooperation Agreement between MIGA and IFC in the event of claims for joint projects where IFC is a senior lender eased the longstanding hindrance to parallel financing. The appointment of MIGA champions in IFC industry units and the financial incentives provided by MIGA to IFC investment teams at financial closure also gave impetus for increased cooperation. Discussions between MIGA, WB's Financial Solutions Unit, and the WB's Sub-Saharan Africa region began in 2010. The revival of World Bank guarantee products also set the stage for the rise in the number of joint Bank Group projects in the last three years.

At the staff and management levels, regular consultations between Bank and IFC country teams are helping better collaboration (Bangladesh, China, Kenya, Indonesia, India), and close communication among World Bank and IFC directors and regional vice presidents helped joint Country Assistance Strategies (India) and spurred joint projects (Kenya). More recently, formalized collaborative arrangements and senior management involvement helped foster greater internal

Bank Group synergy, as with the Bank Group's Joint Energy Business Plan for Nigeria. In April 2014 Bank Group management launched Joint Implementation Plans (JIPs)[17] as a mechanism within the Systematic Country Diagnostic/Country Partnership Framework for fostering better collaboration among Bank Group institutions and placing greater emphasis on leveraging the private sector to provide solutions to development problems (World Bank 2014a).

Feedback from private sector clients points to the need for simplifying requirements and lowering costs (both transactional and business costs) associated with complex structuring. In some cases, the recipients indicated that the process involved in IBRD partial risk guarantees was complex or not easy to understand. Staff from IFC and MIGA conveyed that whenever WB was involved, managing timelines for different processing, especially involving governments and public sector entities, as well as differing E&S guidelines posed challenges. From the perspective of Bank Group staff, however, implementation delays could be partly minimized with a reduction in the multiplicity of policy mandates that must be taken into account in project design and implementation. These policy mandates, usually from shareholders, should be prioritized according to their strong relevance to the project's ultimate purpose. Clear guidance by Bank Group management, including a formalized mechanism delineating interagency responsibilities for appraisal, supervision, monitoring, and managing potential internal conflict of interest issues are required to improve the efficiency of staff-level collaboration. Finally, more focused feedback from private sector clients is necessary to verify the efficiency and value added by joint projects.

In summary, Bank Group–wide collaboration through joint projects added value by jump-starting private sector investments in some countries and providing comfort for investors in large projects, chiefly in generation. In Sub-Saharan Africa, where the access challenge is largest, three low-access countries benefitted (Cameron, Kenya, and Uganda). Total Bank Group commitments during FY2000–2014 for joint projects in low-access countries totaled a little more than $1.7 billion, which is about 13 percent of lending from the Bank Group and 3 percent of the lending from all sources. As previously noted, the projected investment requirements in Sub-Saharan African countries in generation alone is about $25 billion per year, of which $5 billion per year is required through 2030 to meet incremental demand from universal access, and the remaining $20 billion for several years to deal with suppressed demand and increased demand from economic growth.

The relatively small scale of investments made possible by Bank-wide collaboration calls for fresh thinking about how to deploy the Bank Group units' individual and collective strengths to stimulate private sector investments beyond Bank Group–led projects and transactions to facilitate the syndication of the financing gap, especially in generation for low-access countries.

Conclusions

A quantum leap is needed in the access scale-up effort. In low-access countries, a quantum leap in the pace of new connections and levels of investments will be necessary to reach the goal of universal access in the next 15 years.

Best practices point to opportunities. Best practice country experiences, some with Bank Group support, showed that the transition from low access to high or universal access can be made within two decades. Indonesia, Lao PDR, and Vietnam moved to high or universal electricity access through strong and sustained grid-based expansion within two decades. With the Bank Group's ongoing support, Bangladesh achieved a remarkable expansion of off-grid SHS, which quickly brought basic electricity services to nearly 10 million people and is filling the void left by the stalled grid expansion and generation shortages in the country.

A synchronized and comprehensive approach is essential. The country experiences point to the importance of comprehensive and synchronized planning of the national electricity access rollout; integrating grid and off-grid means; ensuring financial viability of the electricity sector and its agents; and addressing affordability, equity, and inclusion through targeting the poor and those in remote and inaccessible areas. All these aspects need to be tied together with a clear government vision and comment to the access goals.

The experience of sectorwide approaches. The first sectorwide approaches in the electricity sector in Rwanda and Kenya are showing better results than a transaction-by-transaction approach and, along with demonstrated government commitment, have so far led to significant financing commitments from various development partners. In particular, the private sector made commitments it may not have made without the sectorwide approach adopted by the two countries. After a long period of stagnation, the access levels increased from 6 percent to 15 percent in Rwanda, and from 23 percent to 30 percent in Kenya during the past four years.

World Bank Group collaboration. Collaboration among World Bank, IFC, and MIGA through joint projects grew with time, though initially in an ad hoc manner. Still, the scale of these joint efforts is a relatively small proportion of Bank Group commitments to the sector. Feedback from both internal and external stakeholders point to a number of areas for improvement. To take effective action in this area, more solid evidence is needed on the value added and on costs and benefits to private sector clients from such joint projects. The challenge is to deploy the Bank Group units' individual and collective strengths to stimulate private sector investments beyond Bank Group–led projects and transactions to facilitate the syndication of the financing gap, especially in generation for low-access countries.

Notes

[1] The estimates are indicative and are based on projected population growth and the following assumptions: average growth of connections during 2000–2010 continues until 2015; $800 per connection; and an added 46 percent for associated generation capacity (World Bank 2010a).

[2] Other instances of Bank Group off-grid efforts in remote areas are the provision of 68,000 solar home systems for nomadic herders in Mongolia, and off-grid components of projects in Lao PDR and Vietnam.

[3] Argentina, Renewable Energy in the Rural Market Project (1999-2012), P006043

[4] Peru, Rural Electrification Project (2006-2013), P090116.

[5] Mongolia, Renewable Energy for Rural Access Project (2006-2012),

[6] Nicaragua, Offgrid Rural Electrification (PERZA) project (2003-2012), P073246.

[7] Lao PDR, Southern Provinces Rural Electrification Project (1998-2004), P044973.

[8] Mali, Household Energy and Universal Access Project, (2004-2012) P073036.

[9] Vietnam, System Efficiency Improvement, Equitization and Renewables Project, (2002-2013), P066396.

[10] Mexico, Renewable Energy for Agriculture Project (1999-2006), P060718.

[11] Lao PDR, Southern Provinces Rural Electrification Project (1998-2004), P044973.

[12] Rwanda Prospectus and Kenya Prospectus.

[13] http://www.ppiaf.org.

[14] World Bank Group collaboration in the energy sector has been on-going prior to the endorsement in 2013 of the One-World Bank Group approach to achieve the twin goals. Intra-World Bank Group coordination in the form of sequential upstream-downstream project linkages, staff consultations at appraisal and in country assistance and sector strategies, providing inputs to appraisal/board documents, assistance with project structuring and government negotiations and follow-up were routinely practiced by operational staff at the three institutions. Crucially, the three institutions have provided parallel financing to numerous projects. IEG was able to identify 25 joint World Bank Group projects, discussed in this section and identified in Appendix S. However, the intra-World Bank Group collaboration prior to the 2013 World Bank Group Strategy was on a need or ad-hoc basis and mostly at the project or transaction level.

[15] Source: MIGA Business Development and Partnerships: Enhancing Effective Collaboration with IFC and across the World Bank Group. PowerPoint Presentation at MIGA Retreat, September 23, 2009, by Jean-Marie Masse (Head, Business Development and Partnerships, IFC-MIGA).

[16] In four years of its operations, the IFC-MIGA Partnership has mobilized a total of US$2.1 billion, focusing on investments in IDA and FCS countries.

[17] Several Joint Implementation Plans are under implementation and in the planning phase, including the power sector in Myanmar, Burundi, Nepal, Nigeria and Georgia.